

# Rediscovery, biology, vocalisations and taxonomy of fish owls in Turkey

Arnoud B van den Berg, Soner Bekir, Peter de Knijff & The Sound Approach

**I**n the Western Palearctic (WP) region, Brown Fish Owl *Bubo zeylonensis* is one of the rarest and least-known birds. The species' range is huge, from the Mediterranean east to Indochina, but it is probably only in India and Sri Lanka that it is regularly observed. In the 19th and 20th century, a total of c 15 documented records became known of the westernmost and palest taxon, *semenowi*, and no definite breeding was described for the WP. These records included just one for Turkey in the 20th century, in 1990. However, while the species appears to be extinct in other WP countries, several pairs have been found in southern Turkey since 2004. New findings in 2009-10 created a rapid increase in our understanding of the Turkish birds' habitat choice, breeding biology, acoustics and DNA. In this paper, the first findings are summarized.

## Distribution and traditional taxonomy

Until recently, fish owls were grouped under the genus *Ketupa*. However, recent DNA research has shown that for reasons of paraphyly it is better to include this genus together with *Scotopelia* and *Nyctea* in *Bubo*. Former *Ketupa* species, Brown Fish Owl, Tawny Fish Owl *B flavipes* and Buffy Fish Owl *B ketupu* cluster as close relatives of Asian *Bubo* species like Spot-bellied Eagle-Owl *B nipalensis* and Barred Eagle-Owl *B sumatranus* (König et al 1999, Sangster et al 2003, Knox 2008, Wink et al 2008, Redactie Dutch Birding 2010).

Based on external morphology and geography, four subspecies of Brown Fish Owl are traditionally recognized. These are *semenowi* (Zarudny, 1905) from Turkey east to north-western Pakistan; *leschenaultii* (Temminck, 1820) (not *leschenault* nor *leschenaulti* according to Dickinson (2003)

403 Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, adult fishing from low branch of plane tree along river, Antalya, Turkey, 27 December 2009 (Arnoud B van den Berg/The Sound Approach)





**404** Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, adult carrying food for fledgling, Antalya, Turkey, 14 July 2009 (Arnaud B van den Berg/The Sound Approach) **405** Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, fledgling at night near nest site, Antalya, Turkey, 15 July 2009 (Arnaud B van den Berg/The Sound Approach) **406** Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, immature (with a few adult-type barred feathers on underparts) perched in tree at side of river, Antalya, Turkey, 5 August 2009 (Arnaud B van den Berg/The Sound Approach)



and König & Weick (2008)) from north-eastern Pakistan, India and Myanmar (Burma) east through Thailand to north-westernmost Malaysia; nominate *zeylonensis* (J F Gmelin, 1788) in Sri Lanka; and *orientalis* (Delacour, 1926) from north-eastern Myanmar to southern China, Hainan and Indochina. The plumages of these four subspecies range from pale in the north-west to dark in the south and east, while nominate *zeylonensis* is smaller (Dickinson 2003, Rasmussen & Anderton 2005, König & Weick 2008). The distribution of *semenowi* is much fragmented with a gap of more than 2300 km between the last known pairs in Turkey and the one in south-eastern Iran.

Fossil records from Corsica, Crete, Sardinia and Italy (former islands Gargano and Tavolara) show that the species was once present all over the Mediterranean basin, often treated as subspecies *lamarmorae* (Dehaut 1911, Mlíkovský 2003). No more bones are known from the onset of the last Ice Age (less than 100 000 years ago), and the population probably disappeared from the western part of its range while the easternmost populations may have 'subsumed' in *semenowi*; the skeletal remains of the extinct population on Mediterranean islands were found on rocks near shores and that is considered to be the habitat where it occurred (Mlíkovský 2003). It is, however, suggested that possibly the same or a related species (known as '*B (z) insularis*') survived much longer in mountainous parts of western Mediterranean islands as a predator of terrestrial prey such as the giant Sardinian Pika *Prolagus sardus*, which still existed in Corsica and Sardinia in the late 1700s or early 1800s (Mourer-Chauvire & Weesie 1986, Mlíkovský 2003, Hoffman & Smith 2005).

### Occurrence in Middle East outside Turkey

There are no recent WP records outside Turkey. The first WP record was in 1863 in Israel, where the last photographically documented individual was seen until August 1975, and where the species is now considered extinct (Shirihai 1996, Ebels 2002). For Jordan, an old specimen and a claim in 1986 are known (Benson 1970, Andrews 1995). The species is listed as accidental for Lebanon. In Syria, two specimens were collected from the 'Kebir' or Khabur river in 1879 (David Murdoch in litt); one of them is a male dated 14 November 1879 in the collection of Naturalis at Leiden, Zuid-Holland, the Netherlands. The information for Iraq is equally scant with just one record of a pair collected in the south in the early 20th century (Cramp 1985, Ebels 2002). In south-eastern Iran (not part of the WP as defined by

Cramp & Simmons 1977), the first record since perhaps a century concerned a pair discovered at the mouth of Gaz river, south of Sirik, eastern Hormuzgan, at 450 km from the Pakistan border, on 18 January 2004; the birds were photographed on 8 April and, on 16 April, a fledgling was seen (van Diek et al 2004). However, the species could not be found at this site in January 2009 (Winkel et al 2010).

### Occurrence in Turkey before 2009

In the late 19th century, three individuals were collected near Mersin and one near Aydin, Turkey (Kirwan et al 2008). The only 20th century record concerned a bird accidentally caught alive in late April 1990 by a fisherman in a river valley surrounded by pines *Pinus* at Berke dam north-east of Osmanyé, between Aslantaş and Sır lakes in the Ceyhan river valley (Gernant Magnin in litt). The owl had swallowed a fish hooked on a fishing line put out at night and was found perched in a nearby tree with the line dangling from its bill; the hook could not be removed, and the bird was kept in captivity for a week during which it did not eat, whereafter it was released 20 km from the original site (Magnin 1991, Ebels 2002, Kirwan et al 2008).

In October 2004, two individuals were photographed during daytime in a rocky and steep river canyon in the western part of the Antalya mountains, southern Turkey; reportedly, the two were also seen during subsequent fieldwork visits, for the last time in 2005 (Yöntem 2007; Sandgrouse 29: 92, 2007; Gernant Magnin in litt). There are reports that the identification was not as straightforward as one may perhaps conclude when reading Yöntem's account (Yöntem 2007; SB pers comm). Apparently, the birds were initially identified as Eurasian Eagle Owl *Bubo*, which is understandable given the fact that there was only one record of Brown Fish Owl for over a century, and it was during a slide show months later that someone suggested the true identity of these birds. They were in a protected reserve without public access and it was decided to keep their location secret. All this may explain why today nobody seems to know the precise spot, let alone whether the birds still occur there, and why there was no follow-up research.

### Turkey sightings in 2009-10 in Antalya region: a detailed account

June 2009

In June 2009, Arnoud van den Berg and Cecilia Bosman

tried to find Brown Fish Owl in southern Turkey for a new The Sound Approach book on owls of the WP region. They asked Soner Bekir whether he knew a suitable area; based upon his directions they searched a number of valleys and rivers in the Antalya region. Unlike the 2004-05 site, these were not in a national park closed for the public but in accessible terrain with roads and tracks. It was almost dark at 20:50 on 20 June when they observed an individual flying along a cliff to a well-wooded river (van den Berg et al 2009). They immediately phoned Mark Constantine and Dick Forsman, who were astounded by the news and offered advice on what to do next. In the following three days, AvdB and CB tried in vain to find more evidence by scanning and climbing the cliffs by day and searching by torch at night. When a German-speaking local told them about two sightings in the past 10 years of a huge owl with a wing 'as long as his arm' perched on a rock in the middle of the river at night, they realized that the species was likely to be a resident in this area. They decided to return in autumn, when the birds were expected to be more vocal, and hoped that SB would be able to document the birds' presence in the meantime. At a later stage, it became clear that this was in fact one of several sites where SB had searched without success a few times before.

#### *July 2009*

As soon as he could, SB returned with Murat Çuhadaroğlu and, as night fell at 21:25 on 2 July 2009, the two of them watched the silhouette of a large owl flying along the same river but at quite a distance (c 10 km) upstream from the 20 June spot. They returned here and struck gold at 01:45 on 4 July when they set their torch on an adult that could be photographed, perched in a pine tree. On 5 July, together with Emin Yoğurtçuoğlu, they found the bird in the same tree at 23:30 and, on 6 July, EY found two adults here, one c 4 km further downstream (Emin Yoğurtçuoğlu in litt). Upon hearing this news, AvdB and CB decided to obtain sounds as soon as possible. The hope for sound-recording was however not high because SB, MÇ and EY had not heard any sound although they mentioned the possibility that the call might simply have been inaudible because of the roaring river. On the night of 12/13 July, AvdB and CB found not only two adults but also a young on the cliff at exactly the same spot where SB and MÇ had been successful 10 days earlier; at dawn, from 05:12, all birds disappeared. Just after 21:00 on 13 July, the fledgling was sitting on a cliff and jumped down on top of a tree, clumsily hanging upside down for 5 min, not being able to fly properly. It was then possible to record some inconspicuous calls of both the adults and the juvenile. On 14 and 15 July, some almost inaudible low-volume sounds of the juvenile were also recorded. The adults were seen leaving the cliff together at 20:47 on 14 July, briefly perching high in the same pine tree against the late evening sky, but otherwise no more than a single adult was seen at the same time. Months later, through contacts with local people, it became obvious that the birds nested in a hole inaccessibly high on the cliff and

not visible from the road. It concerned the first documented breeding record for Turkey and the WP. The fact that the distance between the June sighting and the nesting hole was more than 10 km was encouraging as it seemed to indicate there were at least two territories involved.

#### *August 2009*

On 1-8 August 2009, AvdB and CB returned to the area again in the hope to record more sounds and to see whether they could find more pairs. It proved hard to see any of the owls (no sightings on the first nights) but at 02:15 on 5 August, an immature with a few adult-like barred feathers on the underparts was flushed from the roadside above the river c 400 m downstream from the nesting site. The next night at 22:41, c 10 distant keew calls were heard from a bird flying high along the cliff a bit further upstream. Later that night, from 02:30 to 03:15, at the spot where it had been flushed 24 h before, the same bird (recognizable because of a black spot at the upper mandible base) was present again. It spent most of its time preening but also went for a brief walk in the riverbed. The following night, from 23:48 to 23:59 on 6 August, loud keew calls were recorded from an unseen presumed juvenile, first sitting in a nearby tree and then across the river. The next evening, from 21:50 to 23:11 on 7 August, the same calls were recorded from a bird remaining invisible on the opposite side of the river, 100-500 m upstream from the nesting site. These calls had no resemblance to any published fish owl sounds (cf Schulze 2003, Chappuis et al 2008).

#### *October 2009*

In late October 2009, SB and MÇ visited the same river again. Upstream from the 20 June spot, on 29 October, they found fresh crab *Potamon* remains on rocks in the river, indicating the presence of fish owls. On 31 October, after midnight, they found an individual perched for hours in a pine along the road a few km upstream from the site of the June sighting and, after the bird had flown down to the river, they heard a sound that reminded them of the loud keew call recorded by AvdB in August. They made extraordinary photographs of this bird at 7 m distance. Otherwise, they had no sightings near the nesting site or elsewhere, not helped by bad weather.

#### *November 2009*

On 7 November 2009, EY was phoned by a fish farmer at 45 km down from the 20 June site with the exciting news that four fish owls had been present at his farm the preceding night. In early August 2009, AvdB and CB had met this fish farmer who vividly described frequent encounters at his farm with a family of fish owls in November 2008 and, occasionally, also in December 2008-February 2009 (and in previous winters). EY had been informed about this site by AvdB and, in late October 2009, he visited the fish farm without success together with José Luis Copete and Daniel López Velasco, exchanging phone numbers with the fish farmer.



**407** Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, fledgling roosting by day near nest site, Antalya, Turkey, 14 July 2009 (Arnaud B van den Berg/The Sound Approach)

#### December 2009

On 24-30 December 2009, AvdB and CB paid a fourth visit to the same river valley hoping to record the fish owl's song. They spent nearly all nights at the nesting site, where the temperatures were close to freezing. At 21:45 on 25 December, one bird flew low across the road from the cliff to the river but it could not be found again. The night of 26 December was spent in vain at the fish farm more than 45 km downstream where four had been reported in early November; the fish farmer reported that, in November, the owls had usually been seen between 23:00 and 24:00 but it seemed that this had not happened many times and certainly not in the previous weeks (also not in the next days). Less than 100 m upstream from the nesting site, on 27 December, an adult was found at 21:30 on a low branch hanging over the river where it could be videoed for 20 seconds before flying up, briefly showing again at 22:07 in a treetop before flying onto the cliffs. This was the first time since July that AvdB and CB observed a definite adult. The rest of the night, the birds could not be found despite a lot of effort but, at 03:45 on 28 December, eye-shine from the crown of a huge pine tree along the road betrayed another adult, which could be videoed for 1:30 min. It flew across to the nesting site where it was seen again briefly a few times but not after 05:00, c 80 min before first light. From the images, it was concluded that this was another adult than the one photographed earlier that night and in July, as it had a blacker face. During the last two nights, the only further sighting

concerned an adult seen briefly at 05:15 on 30 December in a tree above the road opposite the nesting cliff.

#### March 2010

On 9-13 March 2010, AvdB and CB visited the nesting area again in an effort to record more sounds. On 10 March, between 21:30 and 22:00, they had several sightings of an adult moving between trees along the river, and at 22:45-23:00 the same bird was perched in a tree above the road. On 11 March, at 20:00, the blackish-faced adult was discovered perched in a high tree along the river; surprisingly, the bird could be videoed and photographed while it remained at this spot until 02:22, sleeping or just looking around for more than six hours, sometimes stretching a wing or moving to another branch. After this, it was watched again briefly perched in a tree at 03:30. During all this time, it made no sounds whatsoever, not even reacting to playback of songs from Chappuis et al (2008).

#### June 2010

On 16-20 June 2010, MÇ and SB visited the nesting site where they watched one juvenile every night and an adult on 17 June. The juvenile was very confiding and could be photographed and videoed down to 3 m. On 23-25 June, EY went to the nesting site with JLC and DLV. On 23 and 24 June, they observed one and, on 25 June, two birds which they photographed, sound-recorded and videoed.



**408** Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, blackish-faced adult in pine tree near nest site, Antalya, Turkey, 28 December 2009 (Arnoud B van den Berg/The Sound Approach)



**409** Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, adult in flight near nest site, Antalya, Turkey, 11 March 2010 (Arnoud B van den Berg/The Sound Approach)

### Turkey sightings in 2010 in other regions

From 11 March to 10 April 2010, SB, Murat Bozdoğan and EY did a survey sponsored by Doga Dernegi (DD), the Turkish BirdLife partner, with funds donated by The Sound Approach. They had scanned Google Earth maps for areas similar to the nesting site found in the summer of 2009 and surveyed in the Taurus mountains near Adana, Mersin, Osmaniye, Kahramanmaras, Hata and east of Antalya. They discovered three new sites where fish owls were present. Detailed information on their findings will be presented in a Doga Dernegi report to be written by SB. At one of the sites, north of Mersin, an apparently unpaired male was singing in the third week of March. SB and EY phoned AvdB who immediately came to record the species' song, from 23:00 to 03:00 in the night of 19/20 March and at 20:30-21:00 on 20 March. Locals revealed that a shepherd had shot the female a few years previously and the male apparently did not succeed to find a new female since. Elsewhere in this area, SB and his team also found a rock with a heap of old crab legs, indicating that another pair could still be

present or an immature had been staying. In the next week, the species was also seen at another site north-west of Mersin. The third site was found in early April at a tourist area east of Antalya. In June 2010, EY returned to the sites north and north-west of Mersin with JLC and DLV but they could not find the species again.

### Morphology of Turkish birds

The only chance to make photographs in daylight during the past year was on 14 July 2009, when the fledgling did not appear to be able to fly up to the cliff at dawn and was asleep in a low bush for the entire day, from 05:15 to 20:30. As could be expected, the plumage colour in daylight differed considerably from that in the many flash photographs, showing a very pale bird like the ones published in Sandgrouse by Yöntem (2007). All flash photographs, somehow, suggested a darker brown plumage. The juvenile did not differ much from the adults except for the fluffy feathering and the lack of horizontal bars on underparts feathers.

### Food

During the first weeks of July 2009, the owls kept returning to the same tree below the nesting cliff, which made it possible to collect not only a handful of feathers but also c 40 legs of freshwater crabs. No remains of fish were found although, at 22:00 on 14 July, an adult was photographed carrying a small fish. On 18 June 2010, one was seen catching a small fish too; it hovered a couple of seconds above the water surface before it grasped the fish.

### Nocturnal behaviour

Interestingly, during all visits in 2009-10, the Turkish fish owls appeared to be very nocturnal, not moving about between dawn and dusk, in contrary to many reports about diurnal activity of Brown Fish Owl in India and Sri Lanka. The birds were often found by their eye-shine in torch light. The owls showed hardly any fear for humans and, in some cases, they remained perched for hours while being watched and photographed at less than 20 m. First-years especially were very confident. Moreover, the sites where they were found were not far from villages and, during weekends, attracted quite some recreational visitors. The owls did not appear to have any problem with flash photography but it was obvious that torch light annoyed the adults (apparently not so much the fledgling). For instance, after a couple of minutes of torch-shining for videoing, they would turn around, hide their face behind a branch, or simply move to another branch or tree. Therefore, little video footage was taken. Videos taken from a long distance on 28 and 29 December 2009 and 11 March 2010 can be viewed at [www.dutchbirding.nl](http://www.dutchbirding.nl) and [www.soundapproach.co.uk](http://www.soundapproach.co.uk).

### Breeding and habitat

The juvenile's behaviour on 12 and 13 July 2009 suggested that it had recently fledged. The fact that no fledgling was seen by SB, MÇ and EY in the first week of July was another reason to think it had just left the nest. In the third week of June 2010, a fledgling was found which was very approachable. One can hypothesize that, as in Eurasian Eagle Owl, there is a period of 12-13 weeks between laying the first egg and fledging, so breeding may start in late March.

It has become clear that the habitat of fish owl in Turkey consists of steep cliffs in mountainous habitat with huge mature pine trees bordering clean freshwater rivers or pools with crab and fish, which do not freeze over during winter.

### Vocalisations outside Turkey

East of Pakistan, Brown Fish Owl is regularly seen and several sounds have been published. The two song recordings in Chappuis et al (2008) concern two subspecies (both probably duetting), *B z leschenaultii* from Huai Kha Kaeng, Thailand, in April, and *B z zeylonensis* from Ratnapura, Sri Lanka, in November.

Chappuis' Sri Lanka song is a deep tri-syllabic *hoo-who-hoo* of c 1.7 s in which the middle note of 225 Hz is clearly higher-pitched, longer and louder than the other two at 195 Hz (Chappuis et al 2008). Because of occasional overlap, this sound concerns a duet (for a sonagram of a similar song, see Rasmussen & Anderton 2005).

Chappuis' Thailand song is a deep three-part *hoho-hoho-hoho* of 1.8 s ranging from 190-230 Hz in which the middle note is slightly higher pitched and longer; the three notes are each c 0.5 s and separated by a pause of 0.1 s while, moreover, there is a very brief break audible in each note. It most likely concerns a duet, with the first and third parts coming from one bird and the central part coming from another.

Hannu Jännes provided two songs from Tala village, near Bandhavgarh tiger reserve, Madhya Pradesh, India, in February 2009 (figure 6). In one case, the third note of the song actually overlapped the second, indicating duetting, and it appears that both started with duetting followed by single hoots from one individual after the other individual flew off or kept quiet. These songs were quite similar to those of Chappuis et al (2008) and the sonagram in Rasmussen & Anderton (2005). Again, the tones ranged between c 190 Hz (first and third note, each 0.5 s) and 220 Hz (second note, 0.7 s), separated by pauses of 0.1 to 0.2 s. Svensson et al (2009) describe the same song as Rasmussen & Anderton (2005), 'a trisyllabic *hoo, whoo hoo* (second 'inhaling' note higher)', again without mentioning that it concerns a duet.

The identification of other sounds published commercially has been questioned including the one of a raucous call from Nepal in November in Schulze (2003) and Chappuis et al (2008) (cf Robb 2009, Chappuis 2010).

For the Thai-Malay Peninsula, Wells (1999) cites Boonsong Lekagul & Round (1991) who describe for *B z leschenaultii* 'a succession of deep mutterings rising to a maniacal laugh, a hoarse, mournful scream, and a soft deep *hup-hup-hu* delivered fast with the last note audible only at close range, the 'drum call'. Whether these descriptions resemble the sounds in Turkey is questionable and some may concern misidentifications. Rasmussen

*Rediscovery, biology, vocalisations and taxonomy of fish owls in Turkey*

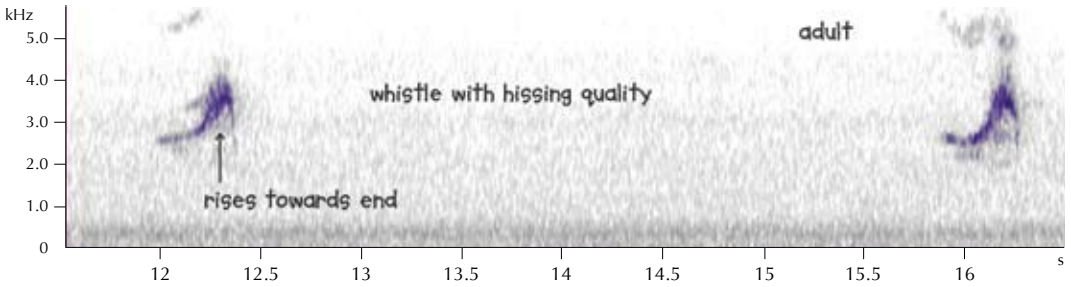


FIGURE 1 Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, adult, call, Antalya, Turkey, 13 July 2009, 090713.AB.210726.02 (Arnoud B van den Berg/*The Sound Approach*). The sound can be heard at [www.dutchbirding.nl](http://www.dutchbirding.nl) and [www.soundapproach.co.uk](http://www.soundapproach.co.uk).

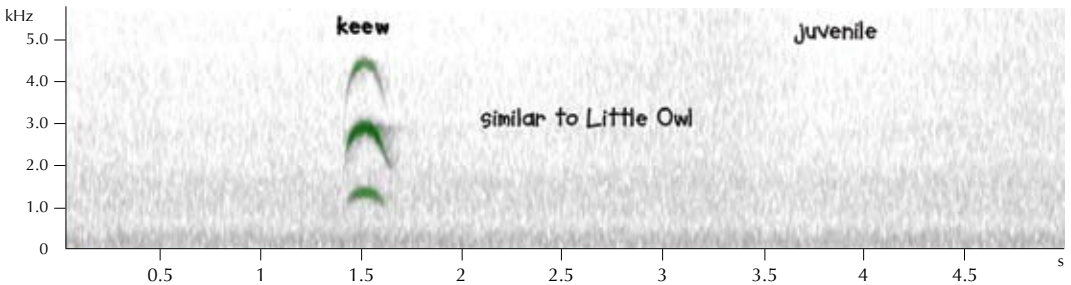


FIGURE 2 Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, fledgling, while moving through trees, Antalya, Turkey, 14 July 2009, 090714.AB.051414.11 (Arnoud B van den Berg/*The Sound Approach*). The sound can be heard at [www.dutchbirding.nl](http://www.dutchbirding.nl) and [www.soundapproach.co.uk](http://www.soundapproach.co.uk).

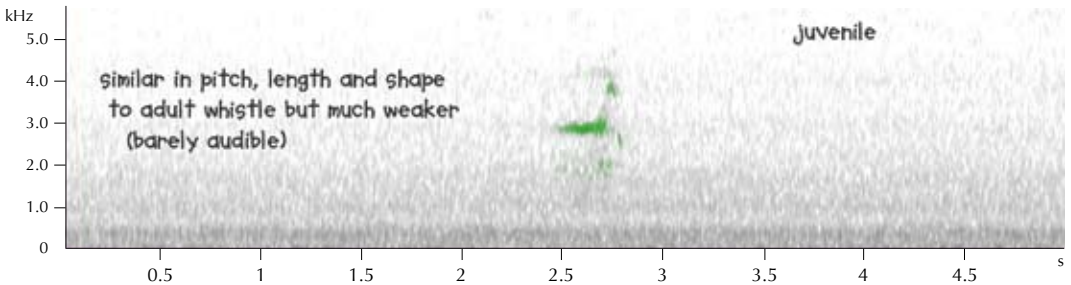


FIGURE 3 Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, fledgling, while perched for long period, recorded at very close range, Antalya, Turkey, 15 July 2009, 090715.AB.211442.01 (Arnoud B van den Berg/*The Sound Approach*). The sound can be heard at [www.dutchbirding.nl](http://www.dutchbirding.nl) and [www.soundapproach.co.uk](http://www.soundapproach.co.uk).

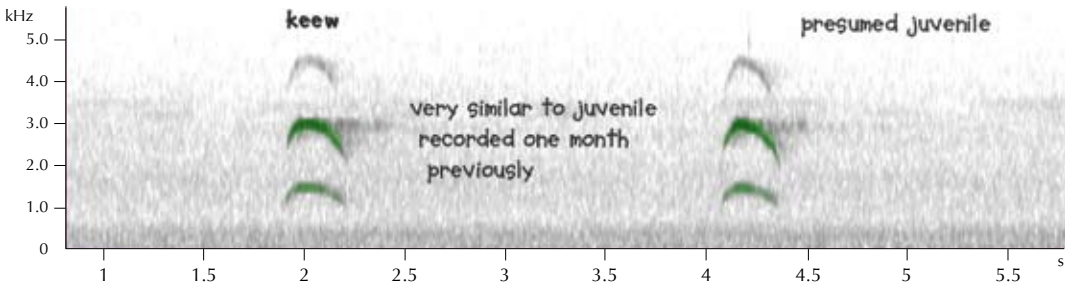


FIGURE 4 Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, presumably juvenile, Antalya, Turkey, 6 August 2009, 090806.AB.234811.21 (Arnoud B van den Berg/*The Sound Approach*). The sound can be heard at [www.dutchbirding.nl](http://www.dutchbirding.nl) and [www.soundapproach.co.uk](http://www.soundapproach.co.uk).



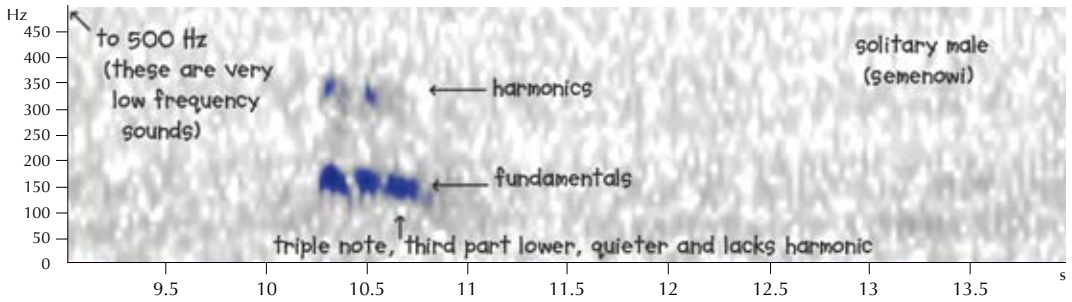


FIGURE 5 Western Brown Fish Owl / Westelijke Bruine Visuil *Bubo (zeylonensis) semenowi*, adult, presumably unpaired male, song, Mersin, Turkey, 20 March 2010, 100320.AB.195220.13 (Arnoud B van den Berg/The Sound Approach). The sound can be heard at [www.dutchbirding.nl](http://www.dutchbirding.nl) and [www.soundapproach.co.uk](http://www.soundapproach.co.uk).

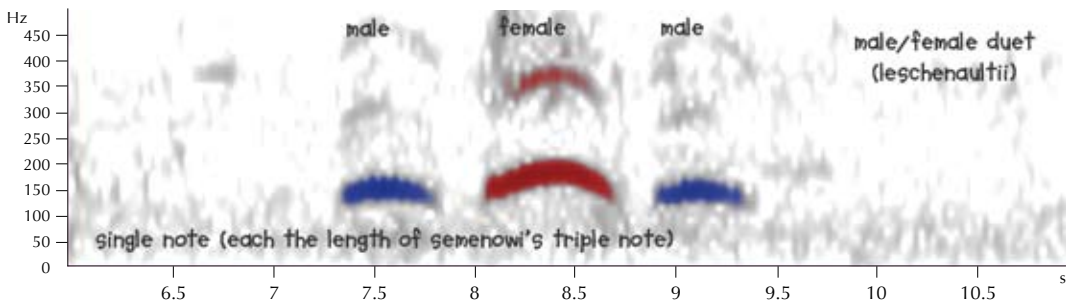


FIGURE 6 Brown Fish Owl / Bruine Visuil *Bubo zeylonensis leschenaultii*, song duet of adults, Madhya Pradesh, India, February 2009 (Hannu Jännes). The sound can be heard at [www.dutchbirding.nl](http://www.dutchbirding.nl) and [www.soundapproach.co.uk](http://www.soundapproach.co.uk).

& Anderton (2005) mention that the species' song in south-eastern Asia (presumably *B z orientalis*) possibly is very different from the one in Sri Lanka but again there is a question about identification.

### Vocalisations in Turkey

So far, a male's song, a presumed duet, a presumed contact call by an adult, hissing calls by a fledgling and *keew* calls by a juvenile have been recorded in Turkey. A selection of these sounds is depicted in sonagrams. The corresponding sound recordings can be listened to at [www.dutchbirding.nl](http://www.dutchbirding.nl) and [www.soundapproach.co.uk](http://www.soundapproach.co.uk).

On 13 July 2009, when the fledgling landed clumsily in a tree and was clearly in trouble hanging upside down, AvdB and CB heard an irregularly uttered, brief, human-like whistle of 0.3 s well above 2700 Hz (figure 1) which appeared to be made by an adult which was looking at the scene from a nearby tree, and could be photographed.

The next night, on 14 July, a brief inconspicuous *keew* sound above 1500 Hz was heard at dawn (05:15) from the fledgling moving from branch to branch before colliding against the cliff, where it remained until dusk (figure 2). In the ear-

ly morning of 15 July, after six hours without any sightings, the same *keew* notes were recorded a few times at 04:20 while watching the juvenile. On this occasion, AvdB could follow the bird for a while as it hopped higher and higher on the cliff, and at c 05:10 he happened to stand eye-to-eye at 2 m in front of the juvenile whereupon it made clicking sounds with its bill (four per second during 3 s), which could not be recorded. The last night, 15/16 July, the juvenile came down from the cliff and landed low in a large pine where it remained the rest of the night, preening and sleeping, sometimes staring in the sky, only producing some hardly audible, high-hissing begging noises (figure 3).

The calls recorded in August were a repetition of very loud versions of the *keew* sounds (figure 4). This sound is reminiscent of a Little/Lilith's Owl *Athene* fledgling and could easily be dismissed as such.

The song recorded by AvdB on 18-20 March north of Mersin was in three parts but not a duet, as it was made by a single bird. The total length was 0.5 s, consisting of two level notes of in total 0.3 s at 190 Hz, the second slightly shorter, and a third descending note of 0.2 s hardly audible and

descending below 135 Hz. In the field, it sounded like a brief double note going down at the end (figure 5).

On 25 June, JLC recorded at the Antalya site a distant song which sounded like a possible duet formed by a 0.5 s short, descending *hohohu* at 160 Hz, similar to the song recorded in March, and followed by a 1 s descending series of fast but hard to discern *hohohohohu* notes at 170 Hz.

None of the sounds of Turkish fish owls, neither the song nor the calls, fitted exactly those known for India or Sri Lanka. There is clearly some variation, also because duetting is hard to determine, but the few songs recorded in Turkey were on average slightly lower in pitch and different in melody, with a descending end. The differences in sound between Turkish fish owls and other Brown Fish Owls will be dealt with in more detail in the forthcoming book on WP owls by The Sound Approach.

### Taxonomy and molecular phylogeny

Since AvdB was unable to find Brown Fish Owl sounds published for India, Sri Lanka or Thailand matching the recordings of calls and song in Turkey, he realized that the Turkish birds could differ in more ways than just plumage and sound. That is why he handed over five feathers collected in July 2009 to Peter de Knijff for genetic research.

PdK sequenced a fragment of 300 base pairs for cytochrome b, compared them with the findings by Wink et al (2008) for Brown Fish Owl (other subspecies than *semenowi*) and Buffy Fish Owl, and found three consistent differences with both fish owl species, identical in all feathers. The Turkish birds showed 98% homology with both Brown Fish Owl (*leschenaultii* or nominate *zeylonensis*) and Buffy Fish Owl, so they differed 2% from both. A divergence of more than 1.5% is often regarded as indicative for species level when supported by morphological and acoustical characters (Helbig et al 2002, Wink et al 2008). It means that the initial DNA results suggest that Turkish fish owls may be regarded as a distinct species although there are still uncertainties, eg, about the provenance of birds that Wink et al (2008) used as reference.

### Further research

PdK will do more molecular research in the very near future using tissues of fish owl specimens from Israel and Syria and some from India to see whether his first results can be corroborated. At the same time, The Sound Approach intends to do

further study on fish owl acoustics, not only in Turkey but also investigating other taxa further east.

Because of the huge gap between the Turkish sites and the nearest recent record in a desert wadi in south-eastern Iran, with obvious differences in habitat, one may wonder in how much the population occurring in mature pine woods around the north-eastern corner of the Mediterranean differs from that occurring in arid and desert areas from Iran through Pakistan. It is also of interest to reassess the ecology and vocalisations of similar species of fish owl occurring sympatrically in tropical areas, such as Buffy Fish Owl in the Thai-Malay Peninsula (for a photograph of a duetting pair, see van den Berg & Bosman 1994).

### Protection

In the first weeks of the discovery, the news was spread to birders who had spent much time in the past years, even decades, in trying to find the owls. However, when the fledgling was found, it was decided to keep the sites secret for the time being in order to be well prepared before birders from all over Turkey and Europe would try to see the birds. It was thought that, within a couple of years, local people could be instructed and birding ecotours organized (cf van den Berg et al 2009).

From the very day that the species was found on 20 June 2009, Mark Constantine was active in involving BirdLife Turkey/Doga Derneği and, in name of The Sound Approach, he offered financial support for whatever they thought was necessary to secure the birds and their habitat. It was decided that the first funds would be used for surveying which resulted in the successful search in March-April 2010 by SB's team.

BirdLife International (the official Red List Authority for birds for IUCN) had given Brown Fish Owl the 'Least Concern' status, mostly because it has an extremely large range. The WP population, however, has a small and disjoint range, possibly with less than 10 pairs, and therefore the species is now evaluated as Critically Endangered for 'the European continent' (Burfield 2008, José Tavares in litt). If the preliminary results on acoustic and molecular research are confirmed and the Turkish birds are to be regarded as a separate species, it is obvious that the need for protection will be felt even more as it will be one of the rarest bird species in the world.

During the search, it became clear that people living in the vicinity of fish owls know the species but are unaware of its rarity. It seemed that it came

as a shock to at least some of them that visitors came from as far as Istanbul and even western Europe to see the owls while before, they sometimes carelessly threw stones or, worse, took a rifle shot at the birds. People working at fish farms along rivers where the fish owls occur, habitually carry guns to shoot at Otters *Lutra lutra* or other animals coming after their fish and a confiding fish owl may be an easy target. Some people even confessed that they killed one or more owls in the past: they may not have done so if they had known how special the birds were. Because of their apparent food preference and for conservation reasons in relation to fish farming, Mark Constantine (in litt) suggested that the Turkish fish owls should be named Yengeç Baykuşu (crab owl) instead of Balık Baykuşu (fish owl). All in all, it seems of prime importance to inform local people. Furthermore, it is obvious that in the few areas where the fish owls occur, the environment needs to be protected, ie, large infrastructural changes or logging should be prevented.

In this context, it may be useful to apply some of the measures taken on Hokkaido, Japan, to protect the rare nominate subspecies of Blakiston's Fish Owl *B blakistoni blakistoni* and to accommodate birdwatchers.

### Conclusions

After a long period without sightings of fish owls in Turkey or the rest of the WP region, in 2004 one area, in 2009 another area with possibly three territories and in 2010 at least three other areas for the species were discovered in the southern Taurus mountains. It became clear that the species is very hard to find not only due to its nocturnal behaviour but also because its mountainous habitat is hard to survey, and its sounds are hard to detect. Therefore, it seems possible that more pairs survive at other sites, despite a variety of threats. New acoustic and molecular research suggests that the Turkish birds could be regarded as specifically distinct, which may add to the reasons to protect them.

### Acknowledgements

Cecilia Bosman, Murat Bozdoğan, Mark Constantine, Murat Çuhadaroğlu, José Luis Copete, Abdullah Dede, René Dekker, Enno Ebels, Dick Forsman, Hannu Jännes, Gernant Magnin, David Murdoch, Magnus Robb, José Tavares, Ibrahim Tuncer, Daniel López Velasco and Emin Yoğurtcuoğlu all assisted in a variety of ways. Magnus Robb prepared the sonagrams.

### Samenvatting

HERONTDEKKING, BIOLOGIE, GELUIDEN EN TAXONOMIE VAN VISUILEN IN TURKIJE. In het West-Palearctische gebied (WP) is Bruine Visuil *Bubo zeylonensis* (voorheen *Ketupa zeylonensis*) een van de zeldzaamste en minst bekende soorten. Het verspreidingsgebied strekt zich uit van het Middellandse Zeegebied oost tot in Indochina. Er zijn vier ondersoorten die van west naar oost verschillen in kleur (bleek in het noordwesten en donker in het zuiden en oosten), formaat (klein in de nominat van Sri Lanka) en geluid. Dankzij vondsten van botten is aangetoond dat voorheen op Kreta en Franse en Italiaanse eilanden in de Middellandse Zee eveneens een ondersoort voorkwam. Het verspreidingsgebied van de westelijke ondersoort *B z semenowi* strekt zich uit van Turkije en het Midden-Oosten tot in het noordwesten van Pakistan en in de landen binnen dit gebied staat hij bekend als uiterst zeldzaam of uitgestorven.

De enige waarnemingen in de 20e eeuw in de WP vonden plaats in Irak (een paar dat aan het begin van de 20e eeuw zou zijn verzameld), Israël (waar de soort sinds 1975 als uitgestorven wordt beschouwd) en Turkije (een aan een vishaak geslagen exemplaar bij Osmanyne in april 1990). In januari-april 2004 werd, buiten de WP, een nest met een uitgevlogen jong gevonden in het zuidoosten van Iran; de soort kon daar in januari 2009 niet worden teruggevonden. In Turkije werden in oktober 2004 twee exemplaren gefotografeerd in een ontoegankelijk natuurreserveaat ten noordwesten van Antalya maar sindsdien is over deze vogels en hun locatie geen informatie beschikbaar gekomen.

Op 20 juni 2009 werd tijdens onderzoek voor een nieuw boek van The Sound Approach een exemplaar in de bergen ten noorden van Antalya waargenomen. De daaropvolgende bijna maandelijkse bezoeken resulteerden in onder meer het eerste bewezen broedgeval en de eerste geluidsopnamen voor de WP en een toename in kennis van de biologie van de soort. Een uitgebreide chronologie van de waarnemingen in het eerste jaar wordt gepresenteerd waaruit onder meer naar voren komt dat er meerdere paren in dit gebied voorkomen. Met de opgedane kennis over de habitat (steile kliffen met visrijk water en hoge oude naaldbomen in het Taurusgebergte) is van 11 maart tot 10 april 2010 verder oostelijk in Turkije naar de soort gezocht en dit resulteerde in drie nieuwe vindplaatsen. De soort is weliswaar niet schuw maar wel moeilijk te vinden door nachtelijk gedrag, lastig te horen geluiden en moeilijk begaanbaar terrein. Op basis van het onderzoek in 2009-10 kan worden gesteld dat hij in Turkije anders dan tot voor kort gedacht werd verspreid is en (nog) niet op het punt van uitsterven staat.

Aangezien er niet alleen in verenkleed maar ook in vocalisaties verschillen bestaan tussen de Turkse *semenowi* visuilen en de taxa in India en verder oostelijk wordt thans getracht om de geluiden in kaart te brengen en vindt er aan geraapte veren DNA-onderzoek plaats. De eerste resultaten van genetisch onderzoek duiden op een verschil van 2% in een cytochroom-b-sequentie tussen dat van de Turkse visuilen enerzijds en zowel andere ondersoorten van Bruine Visuil als Maleise Visuil *B ketupu*

anderzijds. Dit is een aanwijzing dat de Turkse visuilen soortstatus verdienen en om hierover zekerheid te verkrijgen wordt het moleculaire onderzoek voortgezet. Ten slotte worden de mogelijkheden belicht hoe de uilen kunnen worden beschermd en hoe in samenwerking met de lokale bevolking een vorm van ecotoerisme voor vogelaars is op te zetten.

## References

- Andrews, I J 1995. The birds of the Hashemite Kingdom of Jordan. Musselburgh.
- Benson, S V 1970. Birds of Lebanon and the Jordan area. London.
- van den Berg, A B & Bosman, C A W 1994. Selangor International Bird Race 1993. Dutch Birding 16: 26-27.
- van den Berg, A B, Bekir, S & The Sound Approach 2009. DB Actueel: Brown Fish Owl in Turkey and first breeding record for WP. Dutch Birding 31: 268-270.
- van Diek, H, Felix, R, Hornman, M, Meininger, P L, Willems, F & Zekhuis, M 2004. Bird counting in Iran in January 2004. Dutch Birding 287-296.
- Boonsong Lekagul & Round, P D 1991. The guide to the birds of Thailand. Bangkok.
- Burfield, I J 2008. The conservation status and trends of raptors and owls in Europe. *Ambio* 37: 401-407.
- Chappuis, C 2010. Review of Indian bird sounds. *Dutch Birding* 32: 132-133.
- Chappuis, C, Deroussen, F & Warakagoda, D 2008. Indian bird sounds. Hyderabad.
- Cramp, S (editor) 1985. The birds of the Western Palearctic 4. Oxford.
- Cramp, S & Simmons, K E L (editors) 1977. The birds of the Western Palearctic 1. Oxford.
- Dehaut, E G 1911. Animaux fossiles du Cap Figari. Matériaux pour Servir à l'Histoire Zoologique et Paléontologique des îles de Corse et du Sardaigne 3: 53-59.
- Dickinson, E C (editor) 2003. The Howard and Moore complete checklist of the birds of the world. Third edition. London.
- Ebels, E B 2002. Brown Fish Owl in the Western Palearctic. *Dutch Birding* 24: 157-161.
- Helbig, A J, Knox, A G, Parkin, D T, Sangster, G & Collinson, M 2002. Guidelines for assigning species rank. *Ibis* 144: 518-525.
- Hoffmann, R S & Smith, A T 2005. Order Lagomorpha. In: Wilson, D E & Reeder, D M (editors), *Mammal species of the world*, Baltimore, pp 185-211.
- Kirwan, G M, Boyla, K, Castell, P, Demirci, B, Özen, M, Welch, H & Marlow, T 2008. The birds of Turkey. London.
- Knox, A G, Collinson, J M, Parkin, D T, Sangster, G & Svensson, L 2008. Taxonomic recommendations for British birds: fifth report. *Ibis* 150: 833-835.
- König, C & Weick, F 2008. *Owls of the world*. Second edition. London.
- König, C, Weick, F & Becking, J-H 1999. *Owls: a guide to the owls of the world*. Mountfield.
- Magnin, G 1991. A record of the Brown Fish Owl *Ketupa zeylonensis* from Turkey. *Sandgrouse* 13: 42-44.
- Mlíkovský, J 2003. Brown Fish Owl (*Bubo zeylonensis*) in Europe: past distribution and taxonomic status. *Buteo* 13: 61-65.
- Mourer-Chauvire, C & Weesie, P D M 1986. *Bubo insularis* n. sp., forme endémique insulaire de Grand-Duc (Aves, Strigiformes) du Pleistocene de Sardaigne et de Corse. *Rev Paléobiol* 5: 197-205.
- Rasmussen, P C & Anderton, J C 2005. *Birds of South Asia: the Ripley guide 1 & 2*. Barcelona.
- Redactie Dutch Birding 2010. Naamgeving van taxa in Dutch Birding. *Dutch Birding* 32: 48-52.
- Robb, M 2009. Review: Indian bird sounds by C Chappuis, F Deroussen & D Warakagoda 2008. *Dutch Birding* 31: 368-369.
- Sangster, G, van den Berg, A B, van Loon, A J & Roselaar, C S 2003. Dutch avifaunal list: taxonomic changes in 1999-2003. *Ardea* 91: 281-287.
- Schulze, A 2003. Die Vogelstimmen Europas, Nordafrikas und Vorderasiens. Germering.
- Shirihai, H 1996. The birds of Israel. London.
- Svensson, L, Grant, P J, Mullarney, K & Zetterström, D 2009. *Collins bird guide*. Second edition. London.
- Wells, D R 1999. The birds of the Thai-Malay Peninsula 1. Non-passerines. London.
- Wink, M, Heidrich, P, Sauer-Gürth, H, Elsayed, A-A & Gonzalez, J 2008. Molecular phylogeny and systematics of owls (Strigiformes). In: König, C & Weick, F, *Owls of the world*, London, pp 42-63.
- Winkel, E, Amini, H, van Roomen, M & Schelvis, J 2010. Bird counting in Iran in January 2009. *Dutch Birding* 32: 172-188.
- Yöntem, Ö 2007. An observation of Brown Fish Owl *Ketupa zeylonensis* in Turkey. *Sandgrouse* 29: 94-95.

Arnoud B van den Berg & The Sound Approach, Duinlustparkweg 98, 2082 EG Santpoort-Zuid, Netherlands (arnoud.vandenberg@planet.nl)

Soner Bekir, Murver Cicegi sok Arzu apt No 8/8, Kadikoy, Istanbul, Turkey (soner@birdwatchturkey.com)

Peter de Knijff, FLDO, Postzone S5-P, LUMC, Postbus 9600, 2300 RC Leiden, Netherlands (p.de\_knijff@lumc.nl)