MONITORING PROGRAMME for COLLARED FLYCATCHER *Ficedula albicollis*

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Range

The Collared Flycatcher is a monotypic species confined to central and eastern Europe. It breeds from southern Sweden and eastern France to southern Italy, Macedonia and Ukraine. It winters in Africa south of the equator, in central and south-eastern Africa. The population is estimated at 1.4 – 2.4 million breeding pairs (BirdLife International 2013).

Distribution in Croatia

The Collared Flycatcher breeds in deciduous and mixed forests in the lowland and Dinaric regions of Croatia. There is no evidence of a change in the species' breeding distribution during the last two centuries, but it appears that its abundance on migration, especially in coastal Croatia, has decreased during the 20th century (Kralj 1997). The Croatian population was estimated at 60,000 – 150,000 pairs in 2010.

Habitat

Inhabits lowland deciduous forests as well as beech and mixed (beech-fir) forests in mountains (habitat types according to the National Habitat Clasiffication: E1, E2, E3.1, E3.2, E 3.4, E4, E5.1, E5.2, E6). Oak and beech forests are preferred. Requires old forests offering nest-holes high above the ground. In even-aged forests it inhabits stands more than 60 years old while in mixed forests managed by the selection system it inhabits stands with a higher proportion of old trees. It prefers open forests with a sparse understorey (Kralj et al. 2009).

The Collared Flycatcher hunts flying insects and other arthropods, both adults and larvae. Makes sallies from tree crowns, but also gleans from leaves and twigs. Rarely feeds on the ground. In late summer it takes some seeds and berries. Nests in the tree holes, usually high above the ground (10-15 m). Territories are confined to small areas around the nest-hole.

Phenology and population biology

The Collared Flycatcher is a migratory species. Pre-breeding migration lasts from late February to May, and breeding from late April to July. Post-breeding migration lasts from July to early November, while it is present on its wintering areas from November to March. It is regularly present in Croatia from May to July. Annual fluctuations of breeding population size occur, but there is no evidence for an overall change of status.

Pressures and threats
(according to the reference list of threats and pressures for reporting in Article 12 of the Birds Directive)

Logging of old-growth forests (B02.02, B02.06) causes loss of mature deciduous forests and loss of potential nesting trees. Removal of dead and dying trees (B02.04) causes loss of potential nesting trees. Water management reducing the flooding of forests (J02.04.02) decrease the quality of riverine forests and causes habitat loss. Inappropriate pesticide use in forestry (B04) causes reduction of food sources or even poisoning. However, the intensity of these pressures is not so high as to cause significant and widespread population declines in Croatia. Possible privatisation of forests could result in extensive logging of old growth forests and intensification of these pressures, which may pose a threat in the future. Apart from pressures on its breeding grounds, the Collared Flycatcher, as a long-distance migrant, is affected by habitat change and weather conditions (for example, prolonged periods of drought) on its wintering grounds and along the flyway (X0, XE).

Conservation measures

Measures for nature-friendly management of forests are built in to Forest Stewardship Council standards applied in Croatia, but it is important to ensure their implementation. It is especially important to retain a significant percentage of old forest stands in every forested area. Specific measures include: increasing the density of old standing trees and standing dead wood; avoiding replanting of native oak and beech forests with non-native tree species; avoiding clear-cutting over large areas; avoiding water management measures that disturbs the natural flooding regime of lowland forests.

In Croatia, the Collared Flycatcher is fully protected by the Nature Protection Act (OG 70/05). It is a target species in 18 proposed SPAs, and the proposed NATURA 2000 network covers 69.5% of the national population.

Annexes of the Birds Directive
Annex I

Croatian Red List
Least Concern (LC)

MONITORING PROGRAMME

The Collared Flycatcher is a widespread species in suitable forest habitats, with relatively well-known range and habitat preferences. Therefore, counting in randomly selected plots is the most appropriate method for monitoring, with additional research needed to measure detectability in different habitat types. The distance sampling method should be used to correct the field counts and give better estimation of densities and trends.

It is possible to combine monitoring of the Collared Flycatcher with the monitoring of other forest species and with Common Bird Monitoring. For the first stage, apart from the Collared Flycatcher, four common forest bird species with easily recognisable songs and calls can be chosen: Robin *Erithacus rubecula*, Blackbird *Turdus merula*, Chaffinch *Fringilla coelebs* and Jay *Garrulus glandarius*. It should be noted that monitoring can also be extended to resident birds that start breeding earlier in the season (such as tits and Nuthatch *Sitta europaea*); however in that case an additional field visit in April is needed. The same methodology can be applied for site-based monitoring in SPAs.

Training of fieldworkers should be developed by the National Monitoring Coordinator, verified by the Working Group and organised by the Working Group coordinator.

Necessary permits include those for monitoring in National and Nature Parks (roads in some parks can be used by vehicles only with a permit). Croatian Forests and local hunting organisations should be contacted and notified about monitoring times and locations.

Field mapping is not included in the monitoring programme, because this will be done under the Natura Investment Project.

Monitoring on plots

Objective

To employ plot-based monitoring to undertake repeated counts in order to build up a picture of the population trend of Collared Flycatchers on sites and across the entire country. The planned monitoring can be expanded to cover a number of other species covered if enough resources (experienced field-workers and funds) become available. The results will estimate the number of pairs per unit area in different habitat types.

Fieldwork instructions

Fieldworkers should have skills in bird identification, including by hearing songs and calls. They should be able to recognise target species easily, without additional checking of the field guides and/or song recordings, so they can concentrate fully on the presence and movements of birds in the plot. Fieldworkers should also have a basic knowledge of tree species, in order to determine the dominant tree species. They should be familiar with the use of GPS personal navigators and able to digitise their own field data in an appropriate manner (using MS Excel).

Detailed instructions

Each census plot has to be checked twice in the season: between 1st and 15th May and between 20th May and 15th June, with at least 10 days between the two counts. Counts should start half an hour after sunrise and last not more than 4 hours. Mornings without strong wind and precipitation should be chosen.

The point-transect counts method will be applied. Transects should be randomly positioned, while points are regularly distributed along the transect, at every 300 m. Each point is predefined and GPS marked. Each counting point should also be marked in the field (for example with coloured tape).

The counting method follows Voříšek et al. (2008). Counting at each point should last 5 minutes with a 1 minute settling period prior to the counting period. Two fixed-distance bands of 0-30m and 30-100m should be applied, with birds beyond 100m and overflyers also recorded. It is recommended to establish markers around the counting point (at distances of 30 and 100 m) to facilitate correct assessment of distance bands. Birds flushed when approaching a census point should be recorded and included in the totals for that point. In general, singing males should be counted (and interpreted as a breeding pair), but observed pairs (male and female) or an active nest or group of recently fledged young are also interpreted as a breeding pair.

At each sampling point, the habitat type should be noted and four photos (four main compass directions) taken. They should be used to verify the determination of the forest type and to indicate any habitat changes between years.

Sampling design

Over the next six-year period, Collared Flycatchers will be monitored during the 4th - 6th years. Point-transects will be selected by stratified selection. Stratification is based on forest type with four strata: lowland forests (including E1 and E2), sessile oak-hornbeam forests (including E3.1, E3.2 and E3.4), beech forests (including E4 and E6) and fir-beech forests (including E5.1 and E5.2). Because of the patchiness of forest types, the selection of sample 10 x 10 km grid-cells is drawn from two strata – lowland and montane forests.

From 827 10x10 km grid-cells in Croatia, 24 cells have lowland forest (pedunculate oak, ash, poplars and willow forests) cover greater than 30% and 119 cells have montane forests (sessile oak-hornbeam, beech and fir-beech forest) inhabited by Collared Flycatchers with a cover greater than 30%. The ratio of suitable lowland and montane forest cells (0.17 : 0.83) was used to choose the number of grid-cells in each group of habitats: 10 grid-cells in lowland and 50 in montane forests (Figure 1). The total number of 60 grid-cells was agreed as a representative sample size (according to the total number of cells in Croatia) with Dan Hulea, international bird monitoring expert in the ManMon project.

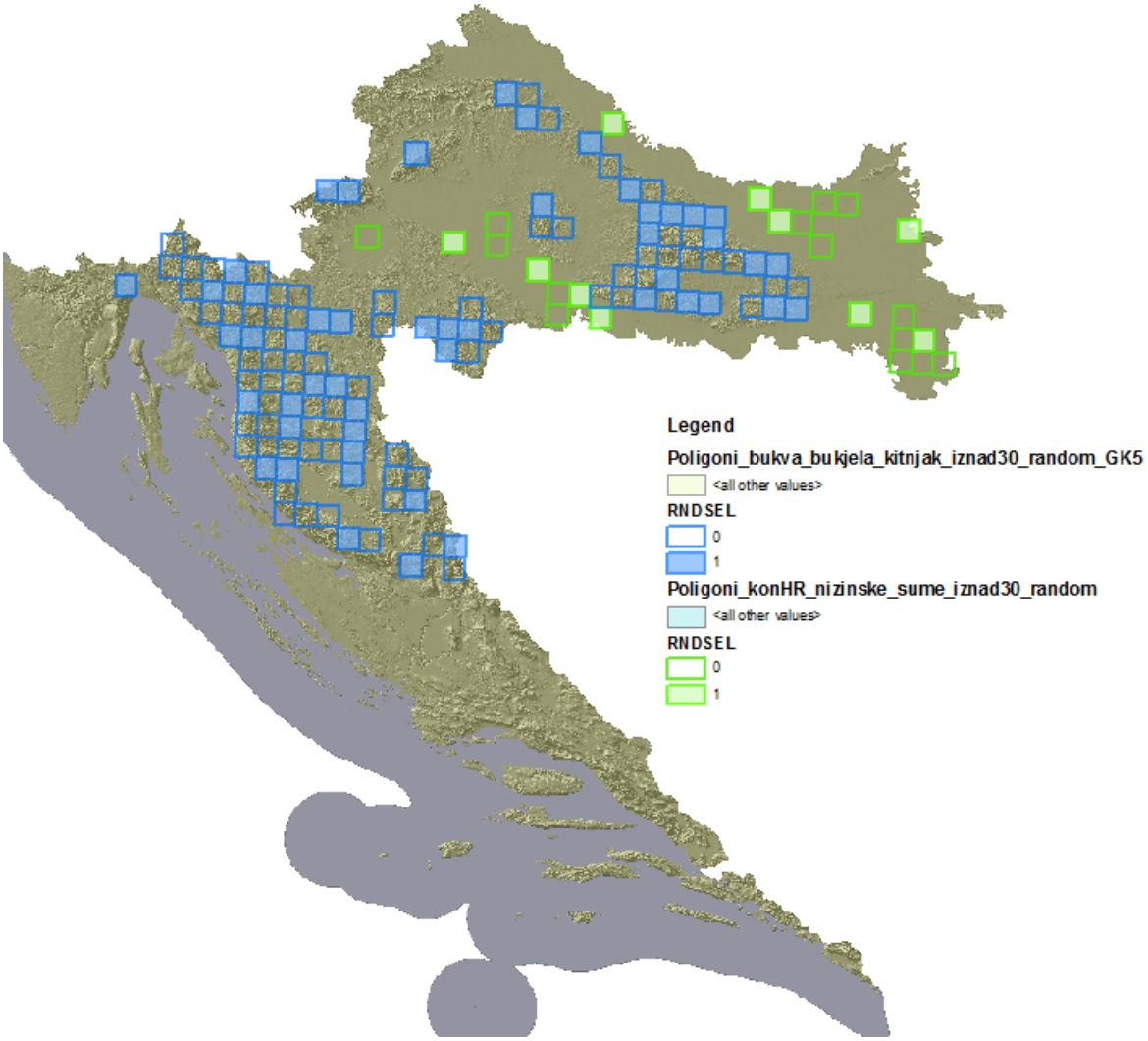

Figure 1. Selection of 10x10 km^2 square grid cells for Collared Flycatcher monitoring

blue outlined squares	10x10 km^2 grid squares with the coverage of mountain forests > 30% of square (N=119)
blue squares	sample of randomly selected mountain forests squares (N=50)
green outlined squares	10x10 km^2 grid squares with the coverage of lowland forest > 30% of square area (N=24)
green squares	sample of randomly selected lowland forest squares (N=10)

In each grid-cell, two transects with 8 points each (total length 2 x 2100 m) should be established. As the Collared Flycatcher prefers older forest stands, 80% of points should be situated in stands more than 60 years old (in even-aged forests) or in forest with a high percentage of older trees (in fir-beech forests managed by selection system). The start of each point-transect should be set in a randomly chosen 1x1 km quadrat with >30% cover of suitable forest type (and age where appropriate) and accessible by forest road. In montane forests, transects should be set to cover forest types (sessile oak-hornbeam forests, beech forests and fir-beech forests) in the same percentages as present in the 10x10 grid-cell as a whole. The point-transect should start 200 m from the forest road and should not follow forest road. However it can follow hiking trails if they are covered with closed canopy. For the

purpose of site-based monitoring in SPAs, if forest patches are very narrow (as locally in Baranja), counting points can be situated less than 200 m from the forest edge or road.

Two-thirds of points should be selected in forest older than 60 years (in even-aged forests) or the forest stands with the greatest amount of older trees (in mixed forests managed by selection system). Both point-transects can be done in a single morning, with the order of count alternated between the two visits (i.e. the transect counted first during the first visit should be counted second during the second visit). To cover 60 point-transects, 150 man-days per year are needed. The first year is a pilot year for the full scheme, after which methodology or organisation of point-transects can be changed accordingly.

Data forms

The data form is attached as a separate document. For each point-transect it is necessary to prepare orthophoto maps showing the transect route, each sampling point and the distance bands. Data should be archived in a database containing: code number of 10x10 km square, code number of the counting point, coordinates of each counting point, fieldworker name, habitat type (including photos), field count number (1st or 2nd), date, time, number of breeding pairs of each counted species per point (for each belt separately). An Excel file with the proposed database layout is attached. Fieldworkers should digitise their data and send them together with a paper copy for quality control.

Scientific research

Objectives

Scientific research is planned to measure Collared Flycatcher detectability, which depends on method, observer and habitat. The results will be used to correct the counts and give better estimates of population densities and trends.

Framework assignment

Detectability should be measured by the distance sampling method (Buckland et al. 1993), the most efficient method of estimating bird density from field data (Voříšek et al. 2008). It takes account of the fact that the number of birds observed declines with distance from the observer. Distance sampling models the distance function and estimates density taking into account not only the birds that were observed, but also those that were likely to be present but were not detected. Data for distance sampling method will be collected through the regular transect monitoring, but at least eight plots (10x10 km grid cell, two in lowland and six in montane forests), will be studied more intensively (4 times per season) in order to collect enough data for measurement of detectability. It will take an additional 20 man-days. The study should be done by the Institute of Ornithology, CASA.

Evaluation of the conservation status components

Population size

Population units are breeding pairs. One singing male or a pair (male and female), active nest or group of recently fledged young are interpreted as a breeding pair.

The proposed monitoring will provide information about relative changes in the population size (percentage of increase or decrease per year), as an index of the population, not the absolute number of breeding pairs. For a widespread species like the Collared Flycatcher, it is impossible to achieve full coverage of the entire country. Therefore birds will be counted in representative sample areas, and the data achieved for each strata (i.e. forest type) will be corrected for differences in detectability and extrapolated from them to the amount of suitable habitats in the whole country (using GIS) and finally added to get the national population size. Data collected by this monitoring method cannot be used for determination of population structure.

Breeding distribution map and range size

The proposed monitoring is designed in such a way that each sampled plot fits a single 10 x 10 km grid cell. Results from the 60 monitored cells can be extrapolated to other cells with the same habitat type (using GIS and PRESENCE software), while more detailed data about distribution will be obtained through the Natura Investment Project.

Main pressures and threats

The proposed monitoring will record changes in population size over time. Such changes can be related to changes in breeding areas or as a result of habitat change, or local climate (including in the wintering areas or along the flyway, as the Collared Flycatcher is a long-distance migrant). Where changes in breeding habitat are related to structural changes of forest type (for example resulting from forest management or other events – e.g. storm, fire, flood), these changes will be recorded (either under "disturbance and threats recorded" on the data form or seen from photos). However, a fluctuation in numbers can also result from decrease in prey availability (as a result of local weather, pesticide use etc.) which cannot be measured under this monitoring programme. In the case of decreasing numbers, additional studies must be undertaken to identify the underlying reasons and to propose appropriate conservation measures.

References

BirdLife International (2013) Species factsheet: Ficedula albicollis. Downloaded from http://www.birdlife.org on 24/01/2013.

Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake 1993: Distance Sampling: Estimating Abundance of Biological Populations. Chapman and Hall, London. 446pp.

Kralj, J. 1997: Croatian Ornithofauna in the last 200 years, Larus 47: 1-112.

Kralj, J., Ćiković, D., Dumbović, V., Dolenec, Z., Tutiš, V. 2009: Habitat preferences of the Collared Flycatcher Ficedula albicollis (Temm.) in mountains of Continental Croatia. Pol. J. Ecol 57(3): 537-545.

Vořišek, P., Klvaňová A., Wotton S., Gregory R. D. (eds.) 2008: A best practice guide for wild bird monitoring schemes. 1st edition. CSO/RSPB.