

MONITORING PROGRAMME FOR MIDDLE-SPOTTED WOODPECKER *DENDROCOPOS MEDIUS*

Davor Ćiković, PhD
Institute of Ornithology, Croatian Academy of Sciences and Arts

Range

The Middle-spotted Woodpecker is resident in the west Palearctic. Its range is bordered by the Zagros Mountains (Iran) to the east and the Cantabrian Mountains (Spain) to the West. It is typically confined to the temperate continental climate zone. Its distribution generally coincides with that of hornbeam *Carpinus betulus* but it is primarily a specialist of mature oak *Quercus* forests (Hagemeijer and Blair 1997).

Distribution in Croatia

The distribution of the Middle-spotted Woodpecker in Croatia coincides with that of continental oak forests. It is found throughout the country except near coasts and on islands. In the Lowland region it is common at lower elevations, while in the higher areas it is occasional. In the Alpine and Mediterranean regions it is very scattered, depending on the presence of old growth mature oak forest patches. The southern boundary of its distribution has yet to be determined. The historical development of its distribution in Croatia has not been studied.

Habitat

Mature deciduous forests, favouring old temperate oak stands (pedunculate, sessile, downy oaks), but other types of lowland high old deciduous forests are also inhabited. Appropriate habitats according to the Croatian national habitat classification are: E.1, E.2, E.3 (except most of E.3.5), E.4 (only E.4.1.1 and E.4.3).

Phenology and population biology

Almost exclusively insectivorous. Excavates wood much less than other sympatric woodpeckers, and forages mostly by gleaning. It is highly dependent on old forest stands for nesting. Monogamous pair bonds are formed and last through the breeding season; it is solitary outside of the breeding season. Territorial throughout the year, but most conspicuously in the breeding season. Breeding densities average about 5 pairs/km², but can reach up to 25 pairs/km².

Pressures and threats

The Middle-spotted Woodpecker is currently not threatened but it is under constant pressure and potentially threatened if pressures intensify. The factors are uniform with other forest woodpeckers and most other forest-dwelling birds: intensification of forest management practices (resulting in loss of old trees, shorter rotations, removal of dead wood, reduced tree species and structural diversity) and habitat fragmentation (reduction of forest extent and loss of forest interior habitats).

Conservation measures

The Middle-spotted Woodpecker is a strictly protected species under Croatian legislation. However, no conservation measures have been put in place yet, and are not urgently needed. Independent supervision of forestry practices is needed to control pressures. If pressures increase then adjustment of forestry practices and management might be needed, for example: strict protection of remaining virgin forests and natural and semi-natural old growth forests (priority should be given to Continental lowland forests where such protection is absent); maintaining and enhancing near-natural old-growth forests by adoption of sympathetic management procedures that mimic natural processes; restoring near-natural forests to natural old-growth conditions; prolongation of the rotation period; avoidance of clear-felling or large-scale shelterwood systems and accompanying fragmentation by encouraging smaller-scale selection systems (group selection and single-tree selection); and avoidance of pesticide and herbicide use.

Annexes of the Bird Directive

Annex I

Croatian Red List

Least Concern

MONITORING PROGRAMME

The monitoring programme concentrates on following the population status and range of the Middle-spotted Woodpecker. It is designed so that it provides information about the population state and its changes and trends, through indices of population size and estimations of national population. It also enables identification of basic environmental causes of a population change.

Woodpeckers form a coherent ecological group that can be surveyed in a similar manner. However, Middle-spotted and Black Woodpeckers were selected for initial programme design for the first time in Croatia and no extension of methodologies can be done beyond these programmes yet.

The programme requires regular collection of field data for subsequent statistical analysis. Fieldwork for this programme can sometimes be physically demanding so fieldworkers (both professionals and volunteers) need to be physically fit and in good health. They all need to be insured against the risk of injuries in the field. Equipment needed for fieldwork should be insured within the programme budget. All fieldworkers should be properly trained and licenced for the fieldwork.

For reasons of safety and better logistics, authorities of Croatian Forests and hunting societies should always be advised about fieldwork schedules.

Mapping of distribution and range

Objective

To record presence/absence data in order to determine/monitor population distribution and range.

Survey design

Data collection will be organised in all 10x10 km grid squares where the habitat type present indicates potential occurrence of Middle-spotted Woodpeckers. All potential squares should be covered once within a single reporting period (6 years) while squares on the current known range borders should be covered

twice. Range fluctuations mean that even squares with "absent" results at the border of the range in previous years should be regularly checked. Fieldwork for this range mapping could and should be incorporated in Atlas or Common Bird Monitoring work, but can also be carried out separately (at higher cost).

Every square with appropriate habitats (>1 km² of high non-fragmented forest listed above) should be visited and checked for presence of Middle-spotted Woodpeckers until absence is the more likely result. Low intensity sound luring is helpful in the pre-breeding period (in April). After detecting a bird, the search can move to another square. Each square should be visited at least twice in one season. If the same Yes/No result is not duplicated within those two visits, a third visit should be made to decide on the square status. One morning should be enough for searching a square.

Fieldworkers

Field data collection does not require a high level of specialisation so it can be done by many volunteers recruited from among amateur ornithologists, birdwatchers, hunters, forest workers and the interested general public.

Fieldworkers need to know the visual and vocal characteristics of Middle-spotted Woodpeckers, and preferably Great-spotted Woodpecker and Lesser-spotted Woodpecker as well (due to habitat sympatry and broad spectrum of overlapping characteristics). Training of volunteers can be done over the internet (a web page with instructions, the test, application form and report form for applicant). The web page should be designed by the National Coordinator and the software developer, supervised by the Working Group.

While most of the fieldwork should not be financed, visits to hardly accessible and remote squares may need some financial assistance.

Fieldwork instructions

The most appropriate period for mapping is from the beginning of April to early May, but relevant data can also be obtained during the second half of June.

Areas chosen for survey within squares should be high (mature) forest habitats. The population density of Middle-spotted Woodpeckers increases with forest age: the youngest forests to search for it should be 40-60 years old and it might be hard to detect it in those forests. Accordingly, searches should preferably start with the oldest forests in a square.

The data to be recorded are: "absent" or "present". If the latter, then the coordinates of the position should be taken (with GPS, also needed to confirm square boundaries) and habitat type noted down to the 3rd level of habitat classification. Use of sound luring (call playback) should be noted.

In squares with "present" status, observers could be asked to estimate the number of pairs by categories such as <10 pairs; 11-100 pairs; >100 pairs. This matter should be decided by the Working Group.

Data form

The recommended data form is provided in Appendix 1.

Monitoring on plots for population status

Objectives

To monitor population status and trends, using population indices and estimation of the national population level.

Survey design

The design for monitoring on plots builds on the full-scale population range information (described above) and requires some additional scientific research (described below). Moreover, habitat parameters should be recorded for assessment of threats and proposals for conservation measures.

The survey work itself is based on the Point Transect method in which observers count birds at points distributed evenly along a transects situated within the Middle-Spotted Woodpecker range (+ buffer zone) and located using the stratified random method (see guidelines below). Each transect is about 10 km long (depending on the availability of habitat) with sampling points spaced at 500 m intervals (10 points per transect). The transects should follow (forest) roads and paths in order to ease their access.

The survey should cover 5% of the minimum estimated national population i.e. about 850 pairs. This can be achieved using some 450 points (40 to 50 transects) most (about 70%) in the Continental region and the rest (about 30%) in the Alpine and Mediterranean regions.

Each transect should be visited at least twice in a six year reporting period. A subset of 10-15 transects should be designated as "permanent plots" to be visited every year and serve to calibrate annual population fluctuations.

Habitat recording is done along the transect after the woodpecker survey is completed (at each visit or once a year for permanent plots), or on some other convenient date. At each counting point, a transect 2m wide and 50 m either side of the point is laid out so that 200 m² (0.02 ha) would be sampled. The following variables should be noted: number of trees of each species (classified in vitality categories), diameter at breast height (120 cm) of each tree, number of trees with woodpecker feeding signs, number of logs.

An easier (and cheaper) option to habitat transects is taking photographs of the habitat at each point station. They should be taken at 0°, 90°, 180° and 270° azimuth with the same angle of camera view (e.g. focal length = 35 mm) and preferably with the same camera on all transects. Additional information about all forestry works (logging, thinning, cleaning etc.) in the area of transects should be obtained from the local forest managers.

Guidelines for setting up the monitoring plots

Initial framework:

- To cover 100% of the species range in Croatia
- To cover 5% of the national population (some 850 pairs)
- To cover the population in all 19 SPAs where it is a target species
- To cover optimal and suboptimal habitats
- To place transects along forest roads and paths

Modelling approach:

- using a GIS, overlay the species range on layers of appropriate habitats (requires maps to 3rd level at least for E3 and E4 habitats, and a map of forest structure to distinguish coppices from tall forests)
- select all 10 x 10 km grid squares with >10 km² of tall forest of appropriate habitat

- randomly select 40 grid squares (about 28 in Lowland Croatia, about 12 elsewhere; repeated until all 19 SPAs are covered)
- randomly select one point per square and find the nearest road/path to the point and treat it as the first point of the transect; try to set up to 10 points at 500 m intervals on the transect line along the road/path
- if the transects do not include a total of 450 points then additional transects/points should be selected (in the approximately 70:30 proportion for Lowland:Alpine/Mediterranean regions).

Fieldworkers

All fieldwork in one year can be done with 8 specialised teams comprising one person for fieldwork in easily accessible areas and two persons in remote or difficult access areas. Accordingly, 12-15 persons should be trained at the outset. The 8 teams can do one set of all transects within 6 working days (a total of 12 work days annually).

The fieldworkers should have a background in ornithological field survey, birdwatching or similar, and be physically fit. After training in the monitoring method, the fieldworker should be capable of Middle-spotted, Great-spotted and Lesser-spotted Woodpecker recognition in the field (appearance, vocalisations, signs and general ecology) and demonstrate ability to estimate distance of field observations.

Fieldwork instructions

Transect surveys are conducted twice during the pre-breeding period (April – mid May) during clement weather (no rain and not more than light winds). The second survey is done between 10 days and 20 days after the first survey, and should start from the opposite end of the first visit. It is desirable that a transect is visited each time by a different observer team.

The survey should commence one hour after sunrise. Moving along transect can be done with a car or on foot. Each point along the transect is visited for 10 minutes: 4 minutes of silent observing and 6 minutes of observing with call playback. Any birds responding are recorded in 3 distance bands from the observer: 0 - 50 m, 50 - 250 m and more than 250 m. Time and azimuth are also recorded.

A subset of 15-20 % of all transects in each year should be surveyed at least three times, and preferably five times, in a season in order to adjust for birds present on plots that remain undetected (MacKenzie et al. 2002). The subsample should cover all major habitat types. This is needed for proper estimation of population size.

Each observer gets a GPS and a paper map for orientation in the field, the data sheet for making records of birds and habitat sampling, and standard playback equipment. They should have their own binoculars, clothing and field equipment. A camera is optional (depending on how habitat data will be recorded).

Habitat recording can be done after the transects for birds are finished (on the same day, or in the following days/months).

Data form

A recommended data form is provided in Appendix 2

Scientific research

Three scientific research projects are proposed. The first has direct implications for monitoring (data analysis) and the other two are recommended for better understanding and predicting of species range and vulnerability to pressures/threats.

Objectives

- A. Detection function (detectability of Buckland et al. 1993) in all major habitat types has to be investigated. It is needed for proper estimation of the national population size.
- B. Natal and reproductive dispersion. Information is needed to assess population viability and its ability to recover from a negative demographic stress. This will be useful for interpreting cases of local rapid (negative and positive) changes of population trends.
- C. Species specific habitat requirements. Needed to describe specific habitat parameters and predict threshold value.

Framework assignment

- A. Assumption: Population size can be estimated on the basis of data gathered for monitoring population trends. To enable estimation, detectability of Middle-Spotted Woodpeckers within major habitat types should be measured. The habitats should be categorised on the basis of variables such as: habitat type groups for woodpeckers (based on the habitat classification for birds: Tucker and Evans 1997), structure of certain habitat subtypes, distribution of Middle-Spotted Woodpecker and its population densities in certain habitat types.
- B. Assumption: the Middle-spotted Woodpecker in Croatia has a viable population able to recover from a negative demographic stress. A telemetry and a medium-term colour ringing research project should be done to test this assumption.
- C. The Middle-spotted Woodpecker is a habitat specialist, and the lowland woodpecker species most vulnerable to changes in habitat. Research needs to determine habitat variables that produce the biggest ecological response of the species. An intensive (minimum three years) habitat selection study should be conducted.

All scientific research should be designed and managed by an experienced woodpecker researcher.

Evaluation of the conservation status components

Population size

Population size should be expressed in number of territories per km², and number of pairs in Croatia, calculated from field survey counts (monitoring on plots) corrected for detectability (MacKenzie 2002) and detection function (Buckland 1993). The estimation can be assisted by using specialised software (like DISTANCE and PRESENCE freeware).

Breeding distribution map and range size

Data on population densities per habitat type overlaid on the habitat map and corrected for the results of the field mapping can be used to produce the range map. Actual presence records can be used to fill 10 km grid squares to represent the species distribution in Croatia.

Main pressures and threats

The main pressures and their location should be determined using statistical methods to analyse available data at regular (3-5 year) intervals. As the first step, population size and trends should be correlated with habitat parameters on national and local spatial scale levels, to identify and rank the parameters that most correlate with population trends. Some important habitat parameters are collected within the programme for monitoring on plots and others are available from forest managers (management plans).

It is apparent that habitat quality (its capacity to support Middle-Spotted Woodpeckers in terms of food and cavities) is the main parameter that influences the population status. Accordingly, the potential need for additional data collection/sampling (i.e. food sampling) should be considered. Some data may also come from monitoring programmes e.g. for saproxylic beetles.

Conservation measures should be proposed by experts after the key pressures/threats and their locations are identified.