Willow Short Rotation Coppice for energy and birdlife: an exploration of potentials in relation to management

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In a densely populated region like Western Europe, the introduction of dedicated energy cropping is hampered by current intensive land use and corresponding high land prices. Possibly, multiple land use is a strategy to overcome this problem: combining energy cropping with other functions may generate more value added per ha of land and reduce costs. Many proposed combination options, such as nature management and recreation, (partially) depend on the occurrence of wildlife in energy farming systems. In this study, we propose and use a method to clarify the relation between willow SRC design and management and the occurrence of breeding birds. This within ranges in which plantation productivity is acceptable. The main target of this work is to provide a framework and propose hypotheses for the relation between management and bird occurrence. We illustrate the method with results from interviews and a workshop with birding experts.

Approach

See Figure 1 for an illustration of the analytical method used. We analysed plantation design and management on a number of agronomic guidelines (inter alia [1-3]. Discerned design and management variables included ones that directly relate to the willow cultivation (such as planting density and fertilisation) and less related variables (such as the establishment of tree rows surrounding the coppice). We constructed a longlist of bird species that could be expected in willow SRC on some field inventories in modern willow SRC for energy (inter alia [4-6]), and in traditional willow coppice (inter alia [7, 8]). These were ordered into ecological groups according to Sierdsema [9]. This grouping was not used as a strict compartimentation, but only to roughly discern species on some general characteristics. The relation between design and management variables and bird species (groups) was submitted to bird experts in interviews and a workshop some with a research background, others field managers of conservation organisations.

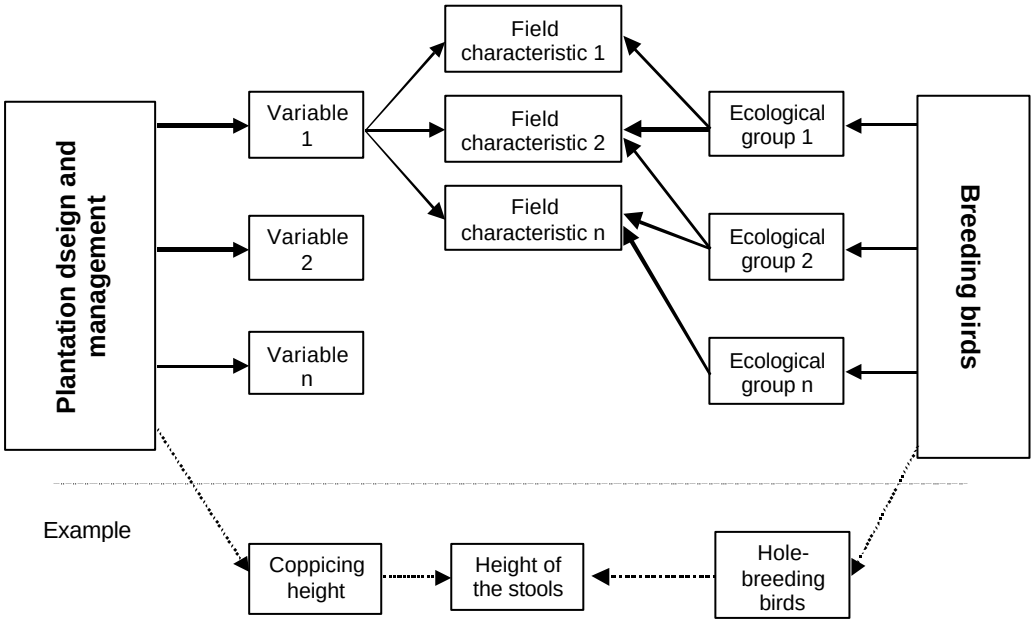

Figure 1: Analytical framework used in this study.

Results and discussion

Some examples of the found relations between management variables and species (groups) are given in Table 1.

Table 1:Relations between plantation design and management variables and responding species.

Variable	Range	Corresponding field characteristic	Responding species or species groups
Groundwater table	Gt I – V[1]	Higher groundwater table: ?? Wetter soils ?? Other, denser vegetation	Positive for moist-loving species (Reed bunting, Bluethroat), provided understorey not removed
Edge-to-area ratio	Square – irregular	Higher E/A: ?? More margins, denser under-vegetation, warmer micro-climate (when oriented S/E). ?? More contact between coppice and other biotopes	?? Positive for all ground- or leaf-fouraging birds ?? Positive for larger birds of woodland, e.g. Woodpigeon, Mistle Thrush, Song Thrush
Planting density and structure	5.000 – 30.000 stems /ha	High densities: ?? First year after coppicing: hardly any difference ?? In years thereafter (crown closure): less undervegetation or open spaces	?? - ?? Negative for many species, e.g. of shrubs (Whitethroat), of young woodland (Wren)

[1]: The lower the number, the wetter the soil. Gt I: winter < 20, summer < 50 cm. Gt V: w. < 40, s. > 120 cm.

In the construction of design and management packages a distinction should be made between first one or two plantation establishment years, in which measures such as active undervegetation control may be necessary. In later years such activities can be left out. On the basis of the analytical results, packages can be set up with attention for specific species groups. For example, with adapted measures in planting density and coppicing height, the coppice can become more attractive for species of shrubs and young woodland who prefer a dense understorey. Species of older woodland could be attracted by a combination of margins with undervegetation and tree rows nearby, giving breeding as well as fouraging habitat for these species.

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