

Application of the stepping-stone-approach when implementing measures for the ecological development of waters in North Rhine-Westfalia

(Here especially presented as a planning instrument for the assessment and provision for significantly adverse effects of measures on water uses)

The north rhine-westfalian programme of measures provides that the so-called stepping-stone-approach has to be applied. This approach is based on research of the German Council for Land Stewardship. This scientific concept, which is established in the practical nature protection, assumes that springing from sections with good structures (origin of streams), water organisms can populate in sections with poorer structures. The stream effects springing from the origin of the streams can be prolonged by creating so-called stepping stones. Stepping stones also have good structures, but the requirements regarding length and structural characteristics are not as high, as they are for origins of streams.

Therefore Origins of streams are sections, in which self-reproducing and sophisticated biocoenosis can permanently exist. Origins of streams at least should have moderate structures. The required length of origins of streams is described in a survey of the German Council for Land Stewardship and will be – under consideration of different water types and pressure situations – put into concrete terms in a survey which is ordered by the North Rhine-Westfalian State Office for Nature, Environment and Consumer Protection.

Minimum requirements for ways of streams are passable river beds and sectionally shadowing resulting from an at least one-sided passing stripe of shady grove. The maximum length of ways of streams, in which streaming effects can occur also is described in the survey of the German Council for Land Stewardship and will further be put into concrete terms.

The stepping-stone-approach provides that the origins of streams should have good or very good structures. The measure “Creating an Origin of streams” therefore often has significantly adverse effects on water uses when structures are bad.

Origins of Streams, Stepping-Stones, Ways of Streams

Considering the described boundary conditions in a first step the required number of origins of streams has been identified. Based on the actual mapping of the quality of water structures, sections have been filtered, which have a structure quality of moderate or better. Longitudes of sections on one stretch have been compared with the longitudes for origins of streams which the German Council for Land Stewardship has recommended.

Furthermore it was assumed that longitudes of ways of streams can be prolonged by creating the respective stepping stones. Concerning this matter for natural water bodies it was assumed, that there the natural conditions are sufficient to admit relatively long ways of streams without creating stepping-stones. In heavily modified or artificial water bodies, creating stepping-stones is necessary for the organisms to survive until they have reached the next origing of streams.

For the given situation it is checked if creating stepping-stones has significantly adverse effects on water uses. Due to the fact that for stepping-stones the requirements for length and structural characteristics are not as strict as they are for origins of streams, the effects of such measures often are not significantly adverse.

Considering these assumptions, the maximum length of a way of streams has been unitary determined at 5 km.

The way of streams is the distance on which water organisms are moved springing from the origin of streams or the distance on which they actively move themselves inside or outside the water. Only ways of streams where the river bed massively is obstructed have been considered due to the fact, that for these ways of streams in each and every case the requirement exists to soften this massiv impact.