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Technical Sheet: Indicator Set 8 Riparian vegetation

Indicators:

- 8.1 Plant species (in accordance with Woolsey et al. 2005, no. 47)
- 8.2 Plant communities (in accordance with Woolsey et al. 2005, no. 50)
- 8.3 Temporal shift in the mosaic of floodplain vegetation categories (in accordance with Woolsey et al. 2005, no. 49)

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This publication is also available in French, German and Italian.

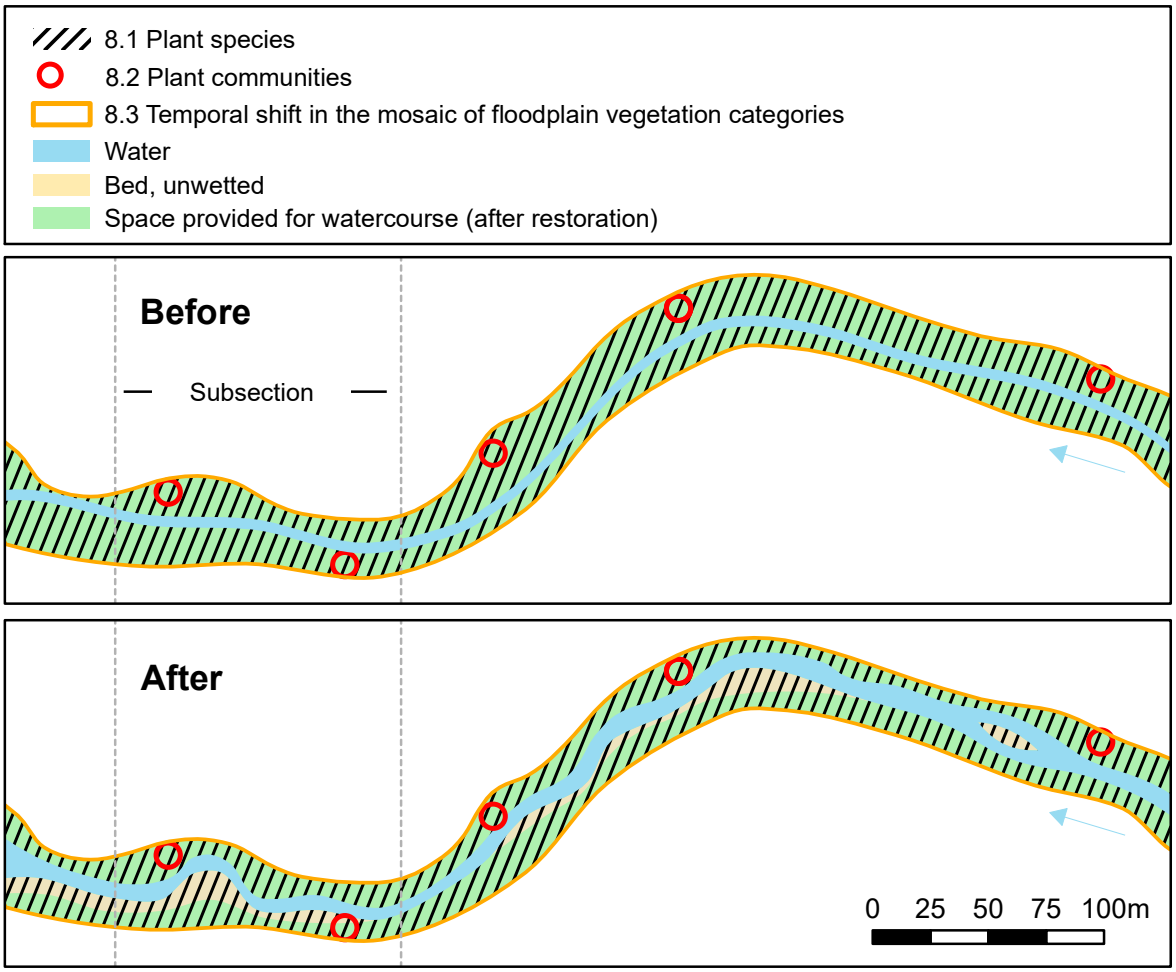
This Indicator Set forms part of the Swiss STANDARD outcome evaluation and is to be used in conjunction with the practice documentation “Evaluating the outcome of restoration projects – collaborative learning for the future” (FOEN 2019). The indicators included in the Indicator Set derive from various sources (e.g. Woolsey et al. 2005; Modular Stepwise Procedure) and, where appropriate, have been updated or adapted for the practice documentation. An overview of the most important modifications made can be found in Factsheet 7.

Principle

Natural riparian and floodplain vegetation is extremely valuable ecologically: it promotes lateral connectivity, provides a habitat and food source for many animals, stabilises the banks and, in hot summers, reduces the water temperature through shading. The development of natural, diverse riparian vegetation is dependent on ecosystem dynamics. But even where the dynamics are intact or have been restored, riparian and floodplain vegetation can be adversely affected by invasive species. The indicators in this set can be used to evaluate both the dynamics and degradation of riparian and floodplain vegetation.

Parameters	• Indicator 8.1 (Plant species): For at least three species, the number of individuals per unit area or the colonised area is determined. Target species and/or neophytes may be selected. Suitable target species include not only rare, threatened or national priority species: other species may also be selected as target species so long as they are indicators of a specific habitat which is to be promoted or restored by the restoration project. • Indicator 8.2 (Plant communities): In permanently marked plots, the plant communities are described by means of phytosociological surveys. A survey comprises a complete list of the vascular plant species present along with their covers. • Indicator 8.3 (Temporal shift in the mosaic of floodplain vegetation categories): Based on orthophotos, a formation/vegetation map is prepared and then verified in the field. The map consists of a mosaic of polygons, described by standardised parameters such as floodplain formation or vegetation unit, height, vegetation cover and proportions of pioneer species (Gallandat et al. 1993, Cole 2002, Bonnard et al. 2008).
Applicability	The determination of this indicator set is dependent on project size: All projects: determination of indicator 8.1 Medium-sized and large projects and individual projects: additional determination of indicator 8.2 or 8.3.
Special considerations	• Vegetation data can be collected over an extended time frame during the vegetation period. Large-scale floods can transform the habitat and modify or destroy floodplain vegetation within a short period. • Any bank planting undertaken as part of restoration is to be explicitly recorded in the raw data for each species (incl. type of planting, e.g. sowing, cuttings, etc.). • The methodology employed for indicator 8.2 allows the raw data to be evaluated according to the WSL approach for monitoring the effectiveness of habitat conservation in Switzerland (WBS) (Bergamini et al. 2019) and the phytosociological approach (Gillet et al. 1991).
Survey site	Restored section, in the space provided for the watercourse (see Fig. 8.1)
Timing	A single survey during the vegetation period (forest: May–July, open areas: June–August). It should be noted, however, that the “after” survey must be carried out in the same period (+/- 2 weeks) as the “before” survey. Otherwise, the areas and coverage for indicators 8.1 and 8.2 may differ considerably.
Material	• Indicator 8.1 (Plant species): General survey material (see Factsheet 8), identification literature, recent aerial photograph for mapping. • Indicator 8.2 (Plant communities): General survey material (see Factsheet 8), metal or wooden stakes, 20 m measuring tape, identification literature, standard survey form, magnifier, possibly a current aerial photograph for orientation purposes. • Indicator 8.3 (Temporal shift in the mosaic of floodplain vegetation categories): Orthoimages (e.g. true color images such as swissimage[1]), geodata[2] to support mapping, GIS, general survey material (see Factsheet 8) for verification of the map in the field. 1: https://www.swisstopo.admin.ch/de/geodata/images/ortho/swissimage10.html#download 2: https://map.geo.admin.ch/?lang=de&topic=ech&bgLayer=ch.swisstopo.pixelkarte-farbe&layers=ch.bafu.landesforstinventar-vegetationshoehenmodell_relief,ch.bafu.landesforstinventar-vegetationshoehenmodell,ch.swisstopo.swissalti3d-reliefschattierung_monodirektional,ch.swisstopo.swisssurface3d-reliefschattierung_monodirektional&E=2793695.75&N=1164253.19&zoom=10&layers_opacity=1,0.5,1,1

Figure 8.1: Survey site for the indicators from Indicator Set 8.



Survey

The individual steps involved in the survey are explained below, in chronological order.

Step	Description	Indicator

Preparation: selection of plant species (target species and/or neophytes)	• After an initial inspection (on foot) of the project perimeter, the target species and/or neophytes are defined. Examples of suitable species can be found in the document «Ufervegetation_Ind.8.1_Empfehlung_Beispiele.xls» (under auxiliaries on the FOEN website). This document contains two Tables: the first lists recommended target species and neophytes by biogeographical distribution and elevation; the second is a more comprehensive species list, providing a more detailed ecological characterisation of each species, incl. examples of guide values for the evaluation. Neither of the Tables is exhaustive, and it is recommended that locally relevant species should also be selected.
	• For each species selected, the type of survey is defined – there are two possibilities:
	  • the number of individuals (e.g. *Myricaria germanica* if fully grown, *Chondrilla chondrilloides*) or
	  • the colonised area is to be determined (e.g. *Calamagrostis pseudophragmites, Impatiens glandulifera)*.
	• Further examples can be found in the second Table of the document «Ufervegetation_Ind.8.1_Empfehlung_Beispiele.xls».
	• At least three species must be selected.
		8.1

Survey of plant species	• For each species selected, the entire project perimeter is inspected and the number of individuals or the colonised area is determined. • If the colonised area is determined for a species, it must be recorded on a map as precisely as possible and the total area in m^2 calculated. • If the number of individuals is counted for a species, the areas where the species is found must also be recorded on the map (although the same degree of precision is not required). In addition, the exact number of individuals must be indicated for the entire project perimeter. • All areas are subsequently digitalised, e.g. using GIS. • The survey may also be performed with the aid of an appropriate app. In this case, digitalisation of areas is not required as this is done directly in the field. Suitable apps for surveying individuals are for example FlorApp (see survey indicator 8.2) and QField, and QField is also suitable for surveying colonised areas. • In all cases, i.e. before and after restoration, the entire project perimeter is investigated (meaning on both shores), even if it has been remodelled between two surveys. This means that the project perimeter must be precisely defined at the time of the "before" survey.	8.1
Phytosociological survey	• Within the project perimeter, minimum five permanently marked plots are established. If possible, these are to be positioned by the specialist where target habitats may develop. Target habitats are habitats according to Delarze et al. (2015), which can occur along watercourses. The following target habitats were defined for indicator set 8:	8.2
	2.1.2.2. Flussufer- und Landröhricht 2.1.4. Bachröhricht 2.2.5. Schwemmufervegetation alpiner Wildbäche 2.3.2. Nährstoffreiche Feuchtwiesen (Sumpfdotterblumenwiese) 2.3.3. Feuchte Hochstaudenflur (Spierstaudenflur) 2.5.1. Einjährige Schlammflur (Zwergbinsenflur) 2.5.2. Mehrjährige Schlammflur (Zweizahnflur) 3.2.1.1. Alluvionen mit krautiger Pioniervegetation 5.1.3. Feuchter Krautsaum (Tieflagen) 5.1.4. Feuchter Krautsaum (höhere Lagen) 5.3.6. Auen-Weidengebüsch 5.3.8. Gebirgs-Weidengebüsch 6.1.2. Weichholz-Auenwald 6.1.3. Grauerlen-Auenwald 6.1.4. Hartholz-Auenwald 7.1.1. Feuchte Trittflur 7.1.6. Mesophile Ruderalflur (Steinkleeflur)	
	• It is important that the number and locations of the permanently marked plots are the same before and after restoration, so that a direct comparison can be made. It is left up to the operators how they ensure precise localisation of the permanently marked plots even after a number of years – e.g. precise determination of the coordinates of the centre of the permanently marked plot (taking the average of repeated GPS measurements) or marking methods like magnetic probes as used in biodiversity monitoring. • The permanently marked plots are circular, comprising an inner (R1) and an outer circle (R2). The areas of the circles are the same as in the WBS method (Fig. 8.2): R1: area = 10 m^2, radius = 1.78 m R2: area = 200 m^2, radius = 7.98 m • In R1, a complete vegetation survey is performed. In R2, the vegetation of the shrub and tree layer is surveyed (Tab. 8.1), i.e. the woody species taller than 0.5 m (approx. knee height). For each species, its cover is indicated according to the Braun-Blanquet scale. • Info Flora's smartphone application FlorApp simplifies the survey in permanent plots, eliminates the need to transcribe data later, and guarantees up-to-date and consistent nomenclature. Flo-rApp can be obtained free of charge at the following link: https://www.infoflora.ch/en/get-involved/my-observations.html	

Determination of floodplain formations	Determination of the temporal shift in the mosaic involves three steps: • Aerial photography / determining availability of aerial photographs (map.geo.admin.ch; freely available from swisstopo since 01.03.2021) • Initially* aerial photographs are used to prepare a map of the floodplain formations, e.g. with 3D-GIS (stereo interpretation). The following formations are distinguished: 1. water 2. bare or sparsely vegetated floodplain sediments 3. floodplain area with herbaceous vegetation 4. softwood floodplain forest 5. hardwood floodplain forest 6. other forest 7. other areas Formations 1–5 are typical of floodplains and thus of particular relevance for the evaluation. The working scale is adapted to the particular question and lies between 1: 5,000 and 1:10,000. • In order to limit the time required for mapping the formations on the site image, a minimum scale should be defined in the GIS used. This can limit a too detailed demarcation. In addition, the thickness of the lines can be increased on the screen, which automatically results in more generalized mapping. Some notes on formation delineation: - Softwood floodplain is recognizable by bright green in the orthoimage and uniform woody structure. - Hardwood floodplain forest is distinguished from the other forests by the tree species composition and terrain characteristics (top-down approach). • Subsequently, the map is verified in the field and amended if necessary (Optionally, vegetation units can be mapped.)	8.3

***** Demarcation and identification keys are defined in advance to ensure consistency and reproducibility (Bonnard et al. 2008). For this purpose, the following tools (in French/German) are to be used (available for download on the FOEN website):

- M-1-TGA (low-lying floodplains) GIS-based orthophoto interpretation: Section 2.3 (pp. 4–7)
- M-8-TGA (low-lying floodplains) field mapping:
  - Appendix A4: Interpretation of Table for description of vegetation
  - Appendix A8: Mapping of vegetation formations
  - Appendix A1: Legend for vegetation map

Figure 8.2: Dimensions of R1 and R2 of the permanently marked plots

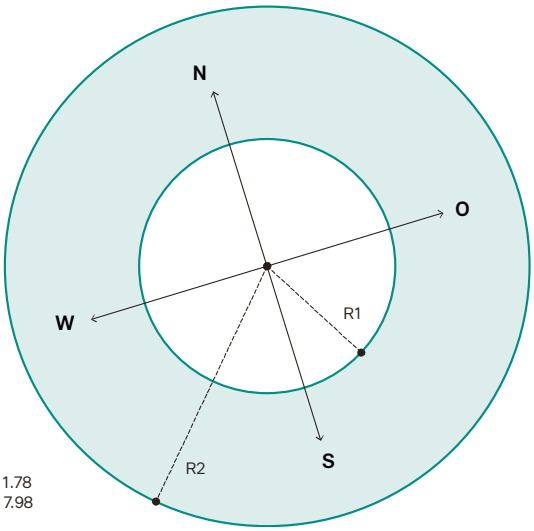


Table 8.1: Stratification of vegetation.

	Layer	Definition
T	Tree layer	Woody plants > 3 m
S	Shrub layer	Woody plants between 0.5 and 3m
H	Herb layer, high	Woody plants < 0.5 m and all herbaceous plants regardless of their height

Evaluation

The evaluation approaches given below are based on the original indicator method sheets from the "Handbook for evaluating rehabilitation projects in rivers and streams". They are provided for guidance and will be revised in the coming years, based on experience accumulated in the course of the STANDARD and EXTENDED outcome evaluations.

Indicator	Description
8.1 Plant species	For the analysis, the raw data (number of individuals, colonised area in m^2) is normalised to a dimensionless value between 0 and 1. This can be done in three steps. The formulas for all three steps are stored in the evaluation document "Auswertung_Set1_Set8_1_02" (under auxiliaries on the FOEN website). This document also contains calculation examples. **Step 1: Extrapolation to 1km stream length.** The data collected in the project perimeter are extrapolated to 1km flow length. Example: Along a 251m long rehabilitation section, 181 individuals are counted for target species X on the right bank and 73 individuals on the left bank, i.e. a total of 254 individuals on 251m. Extrapolated to 1km of stream length, 1'011.95 individuals are counted. **Step 2: Definition of the guide values.** For each species, 0- and 1-guide values are defined, where the 0-guide value reflects the number of individuals or colonized area under non-natural conditions and the 1-guide value reflects the number of individuals or colonized area under near-natural conditions. The 0 and 1 guide values should be adapted to the species. For example, a species such as Salix elaeagnos, which is widespread and occurs on various substrate types, is assigned higher guide values than, for example, Myricaria germanica: the germination of M. germanica is possible exclusively on banks of fine, moist sand. These site conditions do not occur everywhere or in every year. *Example: For the target species X, a 0-guide value of 50 individuals per km stream length is set and a 1-guide value of 2,000 individuals per km stream length.* **Step 3: Calculation of the standardized value.** The extrapolated value from step 1 is translated into a standardized value between 0 and 1. To do this, use a value function that slopes linearly between the two standard values from step 2. For target species, the slope of the value function is positive (see example Fig. 8.3) and for neophytes it is negative (see example Fig. 8.4). *Example: For the target species X with 1,011.95 individuals per km stream length, a standardized value of 0.49 is obtained.*

Figure 8.3: Example of normalisation of the results for target species – distribution of *Myricaria germanica*; guide values for number of individuals arising from seed dispersal along 1 km stream length: 0 guide value: ≤10, 1 guide value: ≥500.

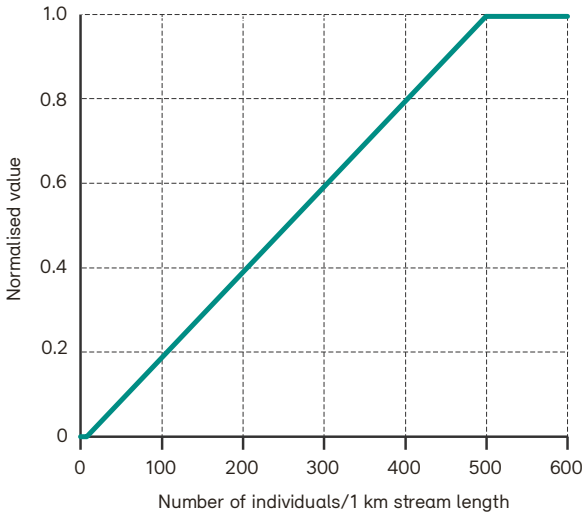
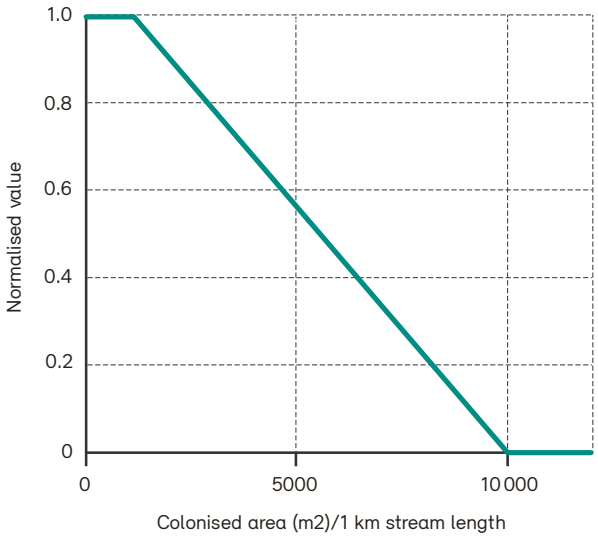


Figure 8.4: Example of normalisation of the results for neophytes – distribution of *Solidago canadensis*; guide values for area (m^2) colonised by neophytes along 1 km stream length: 0 guide value: ≥1 ha, 1 guide value: ≤1000 m^2.



8.2 Plant communities

The data from the phytosociological surveys can be used for two analyses, which are explained in more detail below - a comparison with the species lists of the Delarze habitats (analysis 1, mandatory) and the calculation of the score TypoCH of InfoFlora (analysis 2, optional). Analysis 1 results in an evaluation of the indicator using a standardized value; for Analysis 2, no standardized evaluation is available at this time.

Preparation: Combination of species lists: For the two analyses, the species lists of the two circles R1 and R2 are combined for each permanent plot.

Analysis 1 (Mandatory):
Similarity to species lists of Delarze habitats.

The assessment proceeds in four steps. Steps 1-3 occur at the individual permanent plot level, Steps 4-5 occur at the project level, i.e., across all surveyed permanent plots.

Step 1: Calculation of Similarities: For each permanent plot, the similarity of the combined species list to the societies of all 131 habitats is calculated according to Delarze et al. (2015). Similarity is expressed using the Jaccard coefficient (Legendre & Legendre 1984). This coefficient (SJ_{ij}) is calculated as follows:

$$SJ_{ij} = \frac{a}{a + b + c}$$

where
a = number of species occurring in both surveys i and j
b = number of species only occurring in survey i
c = number of species only occurring in survey j
i = Combined species list in the permanent plot (R1, R2)
j = Species list for the habitat according to Delarze et al. 2015

For automatic calculation of the Jaccard coefficient, there are different options (e.g. with Excel, Vegedaz, R). The species lists of the habitats according to Delarze et al. (2015) can be viewed on the InfoFlora website (https://www.infoflora.ch/en/habitats/full-list.html) or obtained from InfoFlora. In Vegedaz, the assignments can be made automatically, i.e. the species lists of the Delarze habitats are deposited. Vegedaz can be obtained from the following link: https://www.wsl.ch/en/services-and-products/software-websites-and-apps/vegedaz.html . Instructions for calculating the Jaccard coefficient can be found in the file "Ufervegetation_8.2_Anleitung_Vegedaz_1_01" under auxiliaries on the FOEN website.

Step 2: Determination of the highest similarities: For each permanent plot, the highest Jaccard coefficient is identified among the 17 target habitats on the one hand, and among the remaining 114 habitats on the other.

Step 3: Averaging: The highest Jaccard coefficients identified in Step 2 for the target habitats are averaged across all permanent plots.

Step 4: Standardization: The mean value for the target habitats is standardized to dimensionless values between 0 and 1. The following applies:
Guide values: Jaccard similarity coefficient

- 0 guide value: ≤0.1
- 1 guide value: ≥0.5

Between the two guide values the curve is linear (Fig. 8.5).
The following formula can be used to calculate the standardized value (SV):

$$SV = (Mean\ Jaccard\ coefficient - 0.1) * 2.5$$

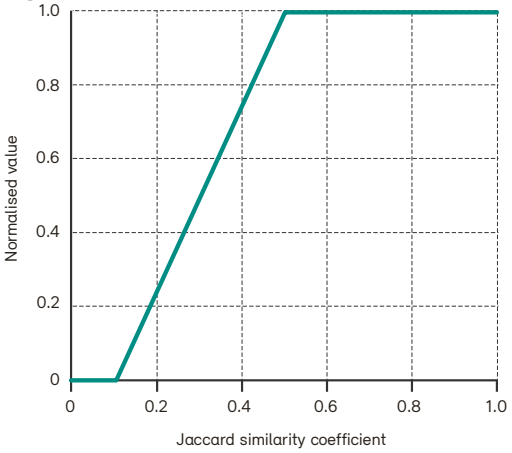
Analysis 2 (optional): Calculation of Score TypoCH from InfoFlora.

A score ("Score TypoCH") is calculated per permanent plot for each vegetation survey for each Delarze habitat. This can be done directly during the survey using FlorApp or as part of the evaluation using Vegedaz (see Vegedaz instructions "Ufervegetati-on_8.2_Anleitung_Vegedaz_1_01" under auxiliaries on the FOEN website). The Delarze habitat with the highest score is the one best described by the Vegetation data.
For each plant found in the field that is also on the list of the respective habitat, the score increases. Characteristics of the species are weighted differently (Table 8.2): In Delarze et al. (2015), a distinction is made for each habitat between character species (marked with a filled-in cloverleaf) and species less strictly tied to the habitat (marked with an unfilled-in cloverleaf). Furthermore, it is taken into account whether these are dominant species that help shape the habitat (marked in bold in Delarze et al. 2015) or not. In addition, the information of the cover ratio from the vegetation survey in the field is added.
Across all habitats, this results in a distribution of different scores. Habitats with few characteristic species or few species achieve lower scores than species-rich habitats.

Table 8.2: Consideration of species characteristics in the calculation of the score TypoCH according to Delarze et al. (2015). Only species included in the species lists of the Delarze habitats are taken into account.

Character species?	Dominant species?	Coverage	Contribution Score
Character species	no	irrelevant	4
Character species	yes	< 5%	4
Character species	yes	> 5%	8
Less strictly habitat bound	no	irrelevant	1
Less strictly habitat bound	yes	< 5%	1
Less strictly habitat bound	yes	> 5%	2

Figure 8.5: Normalisation of the Jaccard similarity coefficient**.**



8.3 Temporal shift in the mosaic of floodplain vegetation categories

The maps produced are stored in the GIS; these are condition maps (example in Fig. 8.6). The areas of the various formations (or units) are calculated. The formulas for both analyses are stored in the evaluation document "Auswertung_Set1_Set8_1_02" (under "Hilfsmittel" on the FOEN website).

Analysis 1: Diversity of floodplain formations

The diversity of floodplain formations describes the complexity of the mosaic of floodplain habitats. Thus, an even distribution of floodplain formations characterises a dynamic system. By contrast, the dominance of one or two formations indicates an impoverished floodplain system. The diversity of existing floodplain formations is calculated using the Shannon index (H'), as follows:

$$H' = -\sum(\ln p_i \times p_i)$$

where:

p_i = Area of existing floodplain formations *i* as a proportion of the total area
i = Floodplain formations such as water, softwood floodplain forest, etc. (see Survey ind. 8.3)

The range of the Shannon index depends on the number of floodplain formations.
For the evaluation, the values of the Shannon index are normalised to a dimensionless value (= degree of satisfaction). For this purpose, it must previously be estimated how many floodplain formations would occur at this site under natural conditions (potential number of formations). This depends partly on the elevation: if a watercourse lies below 1000 m asl, the number of floodplain formations can be assumed to be 5. The 0 and 1 guide values for the Shannon index will vary according to the potential number of floodplain formations (Table 8.3).
Between the two guide values the curve is linear (Fig. 8.7, example for 5 formations).

Analysis 2: Proportion of pioneer formations

Within the study perimeter, the area colonised by pioneer formations is determined. Herb communities and softwood floodplain forests are considered to be pioneer formations. In channelised systems, formations of these types are largely lacking. They are, however, promoted by watercourse restoration.
The curve of the value function is stepped (Fig. 8.8). A proportion of pioneer formations between 0 and 10% corresponds to a normalised value of 0. With a proportion of 50–60%, a maximum of 1 is attained. For proportions over 80%, the normalised value remains at 0.5, owing to the increased value and the rarity of pioneer formations.

Figure 8.6: Map of the Ile Falcon floodplain formations (Sierre/Siders, canton of Valais).
Condition: 1995–1999–2000–2002. Brown: non-floodplain area; violet: softwood floodplain forest more than 5 m high; pink: softwood floodplain forest less than 5 m high; yellow: pioneer herb communities; dark grey: sediments transported artificially as a result of gravel extraction; light grey: natural sediments; blue: water.

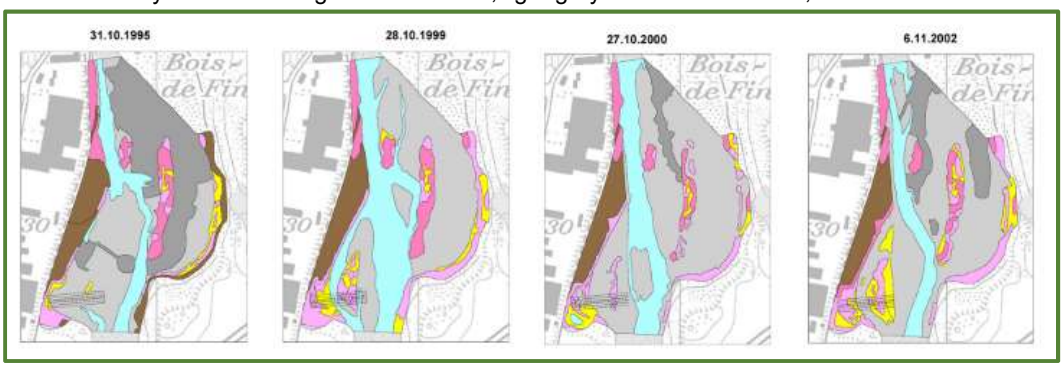


Table 8.3: 0 and 1 guide values for the Shannon index as a function of the potential number of formations.

Potential number of formations	0 guide values	1 guide values
3	≤0.34	≥0.95
4	≤0.43	≥1.20
5	≤0.50	≥1.40
6	≤0.55	≥1.55
7	≤0.60	≥1.70

Figure 8.7: Normalisation of the Shannon index: curve for five formations.

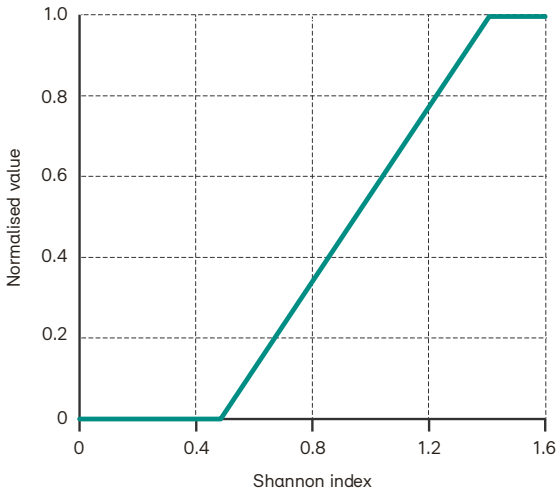
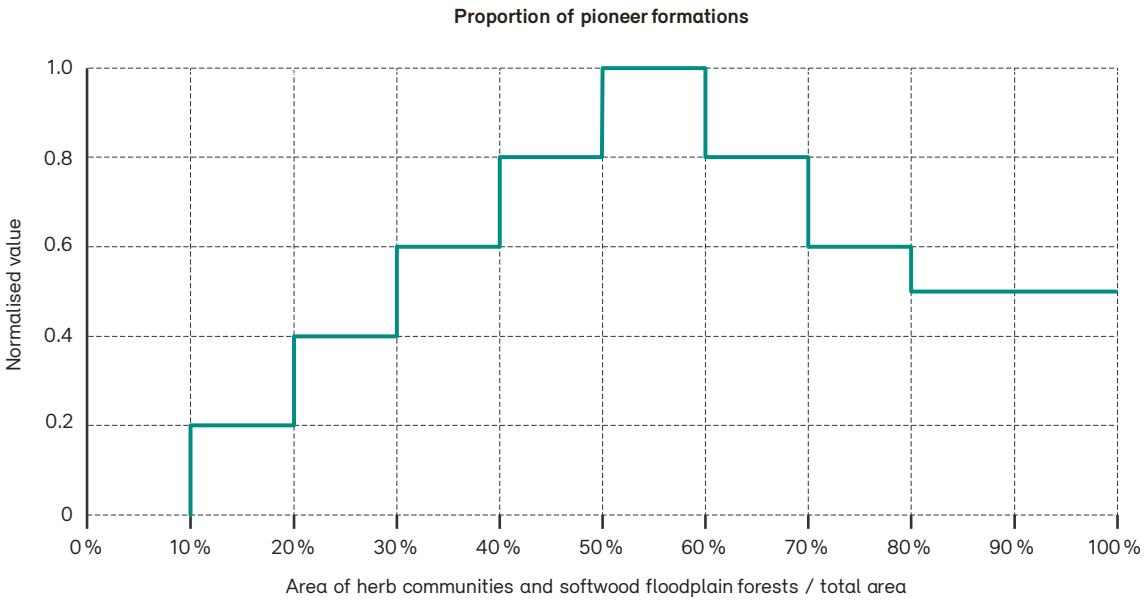


Figure 8.8: Normalisation of the results for pioneer formations.



Time required

As the determination of indicators from this indicator set varies according to project size, a combined presentation of the time required is not included here. A rough cost estimate can be found in Table 2.1 of Factsheet 2.

Table 8.4: Estimated time required in person-hours for the determination and evaluation of indicator 8.1 (Plant species). General items (e.g. travel time for fieldwork) are not taken into account.

Step	Specialists		Assistants	
	Persons	Time per person (h)	Persons	Time per person (h)
Bank survey (1 km, 1 species)	1	2		
Data entry, mapping and evaluation	1	2		
Total person-hours	4			
Notes: -				

Table 8.5: Estimated time required in person-hours for the determination and evaluation of indicator 8.2 (Plant communities). General items (e.g. travel time for fieldwork) are not taken into account.

Step	Specialists		Assistants	
	Persons	Time per person (h)	Persons	Time per person (h)
Installation of permanently marked plot. Phytosociological survey (1 permanently marked plot)	1	1.5		
Data entry and evaluation (1 permanently marked plot)	1	2		
Total person-hours	3.5			
Notes: The time required for surveys is largely dependent on the accessibility of the permanently marked plots. The duration given here was defined for a readily accessible permanently marked plot.				

Table 8.6: Estimated time required in person-hours for the determination and evaluation of indicator 8.3 (Temporal shift in the mosaic of floodplain vegetation categories). General items (e.g. travel time for fieldwork) are not taken into account.

Step	Specialists		Assistants	
	Persons	Time per person (h)	Persons	Time per person (h)
Ordering of orthophotos	1	1		
Demarcation, aerial photograph interpretation (20 ha, 1:10,000)	1	8		
Mapping of floodplain formations (20 ha, 1:10,000)	1	3		
Optional: field surveys (20 ha, 1:10,000)	1	(9)		
Optional: mapping of vegetation units (20 ha, 1:10,000)	1	(5)		
Total person-hours	12 (26)			
Notes: -				

Further information

Data arising	• Excel form Indicator Set 8: KT_ProCode_ERHEBUNG_Set8_V#.xls
	• GIS files, ideally as shapefiles:
	  • KT_ProCode_ERHEBUNG_Set8_Ind8_1
	  • KT_ProCode_ERHEBUNG_Set8_Ind8_2
	  • KT_ProCode_ERHEBUNG_Set8_Ind8_3
	
	Elements of the file naming scheme (see Factsheet 5):
	• KT = two-capital-letter cantonal abbreviation (e.g. BE)
	• ProCode = project code
	• ERHEBUNG = survey time point, i.e. VORHER (= before), NACHHER1 (= after 1), NACHHER2 (= after 2), or VERTIEFT (= EXTENDED)
	• V# = version number of the Excel form

Attachments	The field protocol, the Excel form (including data table) and other tools can be downloaded at: https://www.bafu.admin.ch/wirkungskontrolle-revit

Liste of changes

Relevant changes since the last version are marked in green.

Date (mm/yy)	Version	Changes	Responsibility
4/2020	1.02	Correction of spelling mistakes, small conceptual adjustments	Eawag
4/2020	1.02	Minor graphical adjustments	Eawag
4/2020	1.02	Specification marking permanent plots	Eawag
4/2020	1.02	Technical additions about aerial photo interpretation	Eawag
4/2020	1.02	Reduction of survey costs Indicator 8.3	Eawag
7/2021	1.03	Minor graphical adjustments	Eawag
7/2021	1.03	Specifying habitats from Delarze et al. 2015.	Eawag
7/2021	1.03	Stereo aerial images are no longer a prerequisite	Eawag
1/2022	1.04	Correction of Figure 8.1 regarding the survey location of indicator 8.3	Eawag
1/2023	2.01	Minor graphical and textual adjustments (e.g. moving some illustrations)	Eawag
1/2023	2.01	Specification of the time of the survey	Eawag
1/2023	2.01	Detailed description of the evaluation of indicator 8.1 incl. calculation example	Eawag
1/2023	2.01	Adaptation of the assessment of indicator 8.2 Plant communities (comparison with several target habitats as well as further habitats according to Delarze et al. 2015, use of score TypoCH, detailed description of the procedure).	Eawag
1/2023	2.01	Indicator 8.3 Temporal shift in the mosaic of floodplain vegetation categories: Introduction of notes on the identification of floodplain formations.	Eawag
3/2024	2.02	Specification of digitalisation options in the field for indicator 8.1.	Eawag