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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND NATURAL HABITATS

Group of Experts on Protected Areas and Ecological Networks

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TRANSFER OF NATIONAL DATA TO PAN-EUROPEAN 10x10 km grid for non-EU Contracting Parties to the Bern Convention - Guidance document -

Document prepared by the European Topic Centre on Biological Diversity

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1. BACKGROUND & INTRODUCTION

This document shall provide workflow descriptions of how countries can transfer their national data into the pan-European 10x10km grid used by the European Environment Agency (EEA) and other authorities.

1.1 Background

In the framework of the Bern Convention countries are asked to report national distribution information using the 10x10km grid. The national data can then be used in parallel to the data collection on species/habitat distributions produced by the EEA member countries to show a full European coverage on the distribution of species and habitats.

In order to have a harmonised underlying system the EEA/Council of Europe provides country specific grids for all countries that are members of the EEA or the European Neighbourhood Initiative. These country specific grids are excerpts from the pan-European grid spanning the European continent. The continuous grid system allows for integration of national data without gaps using the same resolution and therefore allowing comparability of data for the whole area covered.

1.2 Grid description

The Pan-European grid has been developed to create a reference grid system spanning the whole territory of Europe which features a true area representation for all parts. This is especially important for the calculation of protected areas or the extent of species and habitat distributions to allow for statistically reliable calculations.

Therefore the coordinate reference system ETRS89/LAEA (European Terrestrial Reference System 1989 geodetic reference frame combined with Lambert Azimuthal Equal Area projection) defined by epsg:3035¹ has been used as a base for the grid system. The westernmost extent chosen is the western limit of the epsg:3035 coordinate reference system while the southern limit has been defined approx. 200km south of the Canaries.

To the east large parts of Russia as well the Caspian Sea are covered.

By this the whole European territory with all Member States of the EEA along with EEA cooperating countries to the East are enclosed by the grid system as shown in Map 1.

¹ <u>http://epsg-registry.org/?display=entity&urn=urn:ogc:def:crs:EPSG::3035</u>



Map 1: Coverage of the Pan-European Reference Grid systems

For different purposes and scales of analyses different grid mesh sizes have been implemented allowing the selection of the appropriate grid cell size based on the demands or availability of input data. The most commonly used grid systems are 1 km, 10 km or 100 km cells. All Pan-European grids are accessible through the EEA Reference Grid collection in the SDI data catalogue² (EEA member states) or the ENI-SEIS II webpage by the Council of Europe³.

The grid cells are attributed based on the location in the European grid.

All cell codes defining a name for the cells are referring to the lower left boundary of the ETRS89/LAEA projection.

So cell codes are constructed of three segments as shown below (Figure 0-1):



Figure 0-1: Example of cell naming by cell code

1.3 Reporting of species and habitat distribution and related technical requirements

In the framework of the Bern Convention involved countries are asked to report their data on distribution information utilising the European 10x10km grid.

² <u>https://www.eea.europa.eu/data-and-maps/data/eea-reference-grids-2#tab-gis-data</u>

³ <u>https://www.coe.int/en/web/bern-convention/-/workshop-on-reporting-under-res-8-2012-</u>

EEA/EC provide country specific grids which have been taken from the Pan-European 10km grid for all countries that are part of the ENI-SEIS II project or member state in the EEA. To allow for more coherent border connection and avoiding loss of species or respectively habitat information all country specific grids contain a 20km buffer surrounding the country borders. When reporting species information countries can make sure all their collected information will be included also in cases where due to the use of a higher resolution country border a grid cell might fall outside the EEA country border.

Below the 10x10km grids for the ENI-SEIS II countries and other countries not being subject to the EU Nature Directives reporting are visualized. All grids shown can be downloaded from the Council of Europe <u>website</u>.



Albania





Azerbaijan

Armenia









"The former Yugoslav Republic of Macedonia"



Georgia



Norway

Russian Federation





2. TRANSFER OF NATIONAL DATA TO PAN-EUROPEAN GRID SYSTEM

2.1 Data requirements

Input data on species or habitat distribution must be described by polygon, point, line or gridded spatial datasets in order to link the distribution information collected to the corresponding grid cells.

^{*} All reference to Kosovo, whether to the territory, institutions or population, in this text shall be understood in full compliance with United Nations Security Council Resolution 1244 and without prejudice to the status of Kosovo.

To avoid displacement and shifts between the actual position based on national coordinate reference systems and the grid cells the national data has to be reprojected to the European projection ETRS89/LAEA before linking to the grids.

2.2 Data preparation

In preparation for the reporting on species and habitat distribution the national data has to be transferred into the required report format.

For all species and habitats the appropriate code representing the species or habitat type must be provided as part of the attributes for each spatial element (polygon, point, line or grid cell).

Figure 0-1 below shows the standard structure of distribution data on species and habitats.

Figure 0-1: attribute structure of habitat and species distribution data

Name	Description	TYPE	Example
code	The Unique identifier. Use the code given in the checklist for reporting	string(15)	1530
maptype	Distribution	string(15)	Distribution
category	Habitats/Species	string(15)	Habitats
isocode	Country code:	string(2)	AT
refgrid	Information about EEA GRID used and its mesh size such as 10x10km, 1x1km,	string(25)	EEA-10km GRID
sensitive	Description if data contains sensitive information "sensitive" or "non-sensitive"	string(15)	sensitive

2.3 Data re-projection

As described before data has to be transferred into the European projection before the linkage to the grid cells. National coordinate reference systems often consist of very country-specific parameters in describing the orientation and position of the nationally established coordinate frame. Therefore, the transfer into the European coordinate reference system (CRS) might be a complex task to be carried out by the geographical information system (GIS). Although most of the common GIS software suites are capable of transferring data 'on-the-fly' - meaning by directly using the initial country CRS on one site (input data) and the European CRS on the other site (grid system) in the same maps – the EEA recommends the re-projection of national data. This is especially the case for complex national CRS which are built specifically for one country as often the translation into the common European CRS EPSG89/LAEA requires difficult computations to recalculate the input coordinates as part of the distribution data in the European projection. The 'on-the-fly' method in many cases only estimates the position of major coordinates to display the input data in the European CRS.

When using the input data directly with the original CRS, the significant risk of displacements is accepted, resulting in potentially wrong positions of the data in the European grid. Even small displacements in the range of a few meters can result in non-linking or the erroneous linking of distribution information to a cell.

To reduce the risk of such shifts and displacements as a result of incorrect or incomplete transformation of coordinates countries are asked to perform a re-projection on their data before combining with the grids.

Depending on the GIS software package used the task of re-projecting the data has slightly different workflows. The figures below show the necessary steps for the two most common data packages QGIS (v3.0.3) and ArcGIS (v10.6):

QGIS	
Input:	State_Reserves.shp → renamed to G1-7.shp as sample data for this guideline → data on state reserves in Armenia ⁴ using epsg:32638 (WGS 84 / UTM zone 38N) assuming state reserves represent habitat distribution for Thermophilous deciduous woodland (habitat code: G1.7)
1	Open 'Processing Toolbox' Processing Help Toolbox Ctrl+Alt+T Graphical Modeler Ctrl+Alt+M
2	Type 're-project' and select 'Re-project layer' by double-click Processing Toolbox
3	Select national data to be reprojected Example:

⁴ AUA Acopian Center for the Environment (<u>http://ace.aua.am/gis-and-remote-sensing/vector-data/</u>)

4	Select EPSG:3035 as target CRS Target CRS EPSG:3035 - ETRS89 / ETRS-LAEA Reprojected Target CRS	
	[Create temporary layer] Python identifier: 'TAR	GET_CRS'
5	Select File as output Reprojected [Create temporary layer] Open output file after running algorithm	Create Temporary Layer Save to File Save to GeoPackage Save to PostGIS Table Change File Encoding (System)
6	Define output path of reprojected national data e.g. originalName_3035.shp Reprojected C:/habitat_species_distribution/HabG1-7_3035.shp	

ArcGIS		
Input:	State_Reserves.shp → renamed to HabG1-7.shp for this guideline as sample data → data on state reserves in Armenia ⁵ using epsg:32638 (WGS 84 / UTM zone 38N) assuming state reserves represent habitat distribution for Thermophilous deciduous woodland (habitat code: G1.7)	

⁵ AUA Acopian Center for the Environment (<u>http://ace.aua.am/gis-and-remote-sensing/vector-data/</u>)

1	Open 'Search For Tools'		
	Geoprocessing Customize Windows Help		
	Buffer		
	Clip		
	- Intersect		
	Union		
	Merge		
	Dissolve		
	Search For Tools		
	ArcToolbox		
	Search For Tools		
	Results Open the Search window so you		
	ModelBuilder tools.		
2	Type 'project' in search window and start search with magnifying glasses		
3	Select 'Project (Data Management)' from tool list		
	Search #		
	Image: Solution Image: Solution Image: Project Image: Solution		
	Any Extent		
	Search returned 30 items		
	Project (Data Management) (Tool) Projects spatial data from one Dordinate system		
	toolboxes\system toolboxes\data management to		
4	Select national data to be reprojected		
	Example:		
	N Project		
	Input Dataset or Feature Class		
	HabG1-7		
	Input Coordinate System (optional)		
	WGS_1984_UTM_Zone_38N		
5	Define output path of reprojected national data e.g. originalName_3035.shp		
	Output Dataset or Feature Class		
	C:\habitat_species_distribution\HabG1-7_3035.shp		
6	Open list of CRS by clicking		

	Output Coordinate System Vertical (optional)			
7	Type 3035 in search bar and press enter			
	Select EPSG:3035 as Output Coordinate System			
	Spatial Reference Properties			
	XY Coordinate System Z Coordinate System			
	🏹 🕶 🔄 3035 🗸 🍳 🔊 🖉 🖛 🔆			
	1 of 6274 items shown			
	Projected Coordinate Systems Continental Europe ETRS 1989 LAEA			
8	Geographic transformation is filled automatically or has to be selected from drop down			
	Example:			
	Geographic Transformation (optional)			
	ED_1950_To_WGS_1984_NTv2_Catalonia + ED_1950_To_ETRS_1989_NTv2_Catalonia			
	'Preserve Shape' does not have to be turned on			

2.4 Data transfer into grid

After the national data has been re-projected in the initial data preparation the distribution information can be transferred into the respective European grid i.e. the country excerpt of the full European grid.

In order to link the data to the grid cells the methodology depends on the type of input data. The following sections will describe the necessary steps for

- <u>Polygon</u> distribution information
- <u>Point</u> distribution information
- <u>Linear</u> distribution information
- <u>Grid based</u> distribution information

For some data types there are multiple ways of linking the data to the grid. For these the workflows are described separately with associated disadvantages and advantages.

2.4.1 Polygon distribution information

Basic spatial intersect method between distribution data and grid



⁶ <u>https://eni-seis.eionet.europa.eu/east/areas-of-work/communication/events/project-related-events/biodiversity-training-on-reporting-to-the-emerald-network/reporting-workshop-documents/reference-10-x-10-km-grid-for-the-reporting</u>

	Q Select by location
	Parameters Log
	Select features from
	→ am_10km [EPSG:3035]
	Where the features (geometric predicate) intersect touch contain overlap disjoint are within equal cross By comparing to the features from HabG1-7_3035 [EPSG: 3035] Selected features only Modify current selection by creating new selection
	6
	\rightarrow Run select by location
3	Intersecting grid cells will be selected and highlighted

4 Ri	Right-click on the country grid (am_10km) and select 'Save as'		
	am 10	<u>km</u>	
		💭 Zoom to Layer	
		Show in Overview	
		📮 Remove	
		🗔 Duplicate	
		Set Layer Scale Visibility	
		Set Layer CRS	
		Set Project CRS from Layer	
		Styles •	
		Open Attribute Table	
		🥢 Toggle Editing	
		Save as	
		Save as Laver Definition File	
	Format	ESRI Shapefile	
	File name C:\habitat_species_distribution\HabG1-7_3035_gridCells.shp Layer name CRS EPSG:3035 - ETRS89 / ETRS-LAEA		
	Encoding	UTF-8	
✓ Save only selected features ✓ Add saved file to map			
	1	OK Cancel Help	
5 De	edicated grid	shapefile only containing those grid cells which are intersecting with that in this case is produced.	



	Q Field Calculator	Q Field Calculator
	Only update 0 selected feature Create a new field Create virtual field Output field name CODE Output field type Text (string) Output field length 10	 Only update 0 selected Create a new field Create virtual field Output field name MS Output field length 10 Expression Function = + - / * ^ 'AM
9	Save edits Q HabG1-7_3035_gridCe	ells :: Fea 🛛 🔇 HabG1-7_3035_gridCells :: Featu
	abc CELLCOL Save edits (Ctr	H+S)



 $^{^{7} \}underline{https://eni-seis.eionet.europa.eu/east/areas-of-work/communication/events/project-related-events/biodiversity-training-on-reporting-to-the-emerald-network/reporting-workshop-documents/reference-10-x-10-km-grid-for-the-reporting-to-the-reporting-to-the-emerald-network/reporting-to-the-eme$

	Selection Geoprocessing Customize Windows Help Select By Attributes Image: Select By Location Image: Select By Location Image: Select By Grap Image: Select By Grap Select By Grap Select By Grap Image: Select By Location Image: Select By Location Image: Select By Grap Select By Location Select By Location Image: Select By Grap Select By Location Selects features using the location of features in another layer. Image: Select By Grap Selects features using the location of features in another layer. Select By Location
2	Create a new selection by querying all grid cells which intersect with the habitat distribution data (here state reserves) Select By Location Select features from one or more target layers based on their location in relation to the features in the source layer. Selection method: select features from Target layer(s): am_10km HabG1-7_3035 am_10km Only show selectable layers in this list Source layer: https://www.selectable-layers Use selected features (0 features selected)
	Spatial selection method for target layer feature(s): intersect the source layer feature → Run select by location with 'OK'





This method of selecting intersecting grid cells represents a basic and easy way to carry out the generation of a grid containing only cells where the habitat or species distribution is actually found.

The major disadvantage is that all cells which are intersecting for only very small areas will be included in the distribution raster. There are no thresholds in this method to filter cells that only intersect for negligible levels of overlapping data.

To introduce a minimum area or percentage of area filter the method shown next has to be applied.

Advanced spatial union method between distribution data and grid

The methodology shown here is just one way of creating the habitat/species specific distribution dataset incorporating thresholds. There are other ways which will also result in a separate dataset with the grid cells only where the distribution actually appears to the required extent. For the sake of convenience only one method is shown here.



	Q Polygon uunion ?	×
	Parameters Log	1.7
	Layer A	
	🖓 am_10km [EPSG:3035] 🔹 📖 🧔	
	Selected features only	
	Layer B	
	AbbG1-7_3035 [EPSG: 3035]	
	Selected features only	
	Split Parts	
4	Define an output path for the union-dataset	
	Union	
	C:/habitat_species_distribution/HabG1-7_3035_gridCells_union.shp	
	Open output file after running algorithm	Save to a Temporary File
		Save to File
5		Change File Encoding (System)
3	New dataset combining the distribution data as well as the grids is	produced
	\rightarrow Load new produced shapefile	
6	Calculate new field holding the area of each polygon	
	\rightarrow open attribute table	
1		

	HabG1.7 3035 gridCalls union					
		P	Zoom to Layer			
			Show in Overview			
			Remove	-		
			Duplicate			
			Set Layer Scale Visibility	- F		
			Set Layer CRS			
			Set Project CRS from Layer			
			Styles	• •		
		11	Open Attribute Table			
		1	Toggle Editing	3		
7	Open field calculator					
,						
	HabG1-7_3035_gridCells_union :: Features	lotal:	552, Filtered: 552, Selected: 0		N.S. 11 - 540.0	
					.	
	CELLCODE EOFORIGIN N	IOFOR	IGIN CODE	Oper	n field cald	ılator (Ctrl+I)
8	Calculate new field area, sokm (area in soua	are ki	lometre km²)			
0	Calculate new field alou_sqkiii (alou in sque					
	Q Field Calculator					
	Only update 0 selected features					
	Create a new field		[
	Create virtual field					
	Output field name area sokm					
	Output field type Decimal number (real)	•				
	Output field length 10 + Precision 5	÷				
	Expression Function Editor					
	= + - / * ^ () \n'	Sea	ir(
	\$area / 1000000	, s	1			
89)	As multiple polygon features might occur in	n the	same cell external proce	essing of t	he data	
00)	is needed if more precise information is war	nted.	same cen, externar proce	ssing of t	ne uata	
	By using the calculated area values, as they	are p	roduced until this step in	the case of	of	
	multiple elements in the same cell, only the	area	of one polygon feature w	ill be join	ed to	
	the grid in the next step.					
	If this accuracy is acceptable proceed with s	step 4				
		r				
	To further process the data and incorporate	the a	rea of all features within	one cell co	ontinue	
	with 3b) below.					
8b)	To calculate the actual area of all features w	vithin	one cell open the *.dbf f	ile from th	ne	
	shapefile (in this example HabG1-7_3035_g	gridC	ells_union.dbf) in a calcu	lation sof	tware	
	such as Excel.					

	 → Create pivot table fr FILE HOME FILE HOME PivotTable Recomm PivotTables PivotTable → select Cellcode as Code should not differ should only represent of 	 Create pivot table from all columns Create pivot table from all columns FILE HOME FILE HOME PivotTable Recomm PivotTable PivotTable PivotTable Select Cellcode as row and Region as column for pivot table (XX country as well as ode should not differ as these are fixed for the country respectively the input data which rould only represent one tupe of species or babitat) 		
	T FILTERS	III COLUMNS		
		Region		
	ROWS	∑ VALUES		
	CELLCODE -	Sum of area_sqkm 🔻		
	 → filter only cells have → save as Excel work able to read output form → HabG1-7_ 	ing value for 'Region' → deselect 'blanks' kbook (*.xlsx/*.xls) or other tabular data (please check if QGIS is nat if different from *.xls) 3035_gridCells_union_pivot.xlsx		
	\rightarrow load saved tabular d	ata and continue at step 16		
9	9 Select all grid cells where the habitat or species is present and the threshold chose fulfilled in attribute table			
	- 🝳 HabG1-7_3035_grid	ICells_union :: Features Total: 552, Filtered: 552, Selected: 0		
		💼 🛰 🖄 🛅 📴 🔜 💊 🌄 🍸 🇱 🗞 🔎 🔠		
	CELLCODE EOFORIGIN Select features using an expression			
	Select by Expression	- HabG1-7_3035_gridCells_union		
	Expression Function	Editor		
	= + - / *	II () '\n' Search		
	"CODE" <> "			
	"area_sqkm" > 30			
Explanation of selection expression:				

	 All polygons/features are selected which have a habitat/distribution code → CODE <> (not equal) '' (empty) 		
	• are bigger than the defined area must be bigger 30km ² = 30% of 1	a threshold (here 30 is taken as it means feature l0x10km cell)	
10	Export selected polygon into new file by (e.g. HabG1-7_3035_grid_distribution_selected features'	right click on union dataset, setting output path featureParts.shp) and selecting 'Save only	
	HabG1-7_3035 gridCells union Image: habG1-7_3035 Image: habG1-7_3035	 Zoom to Layer Show in Overview Remove Duplicate Set Layer Scale Visibility Set Layer CRS Set Project CRS from Layer Styles Open Attribute Table Toggle Editing Save as 	
11	Join exported features to raw grid cells as am_10km Zoom to Layer Show in Overview Remove Duplicate Set Layer CRS Set Layer CRS Set Project CRS from L Styles Open Attribute Table Toggle Editing Save as Save as Layer Definition Filter Show Feature Count Properties	gain by opening properties of country grid	
12	Create a new join connection		

	Q Q Setting Setting Attributes Form Inis Auxiliary Storage Actions Display Actions Display Kendering Variables Metadata Pependencies Legend Legend QGIS Server			
13	Define join to exported se	election of grid cell parts	?	×
	Join layer	HabG1-7_3035_grid_distribution_featureParts		-
	Join field	abc CELLCODE		•
	Target field	abc CELLCODE		•
14	Select all grid cells where am_10km :: Features Total: 534 CELLCODE EOFORI 1 10kmE733N247 7 2 10kmE734N247 7	e the joined field 'code' is not empty 0, Filtered: 530, Select Q Select by Expression - am_10km Expression Function Editor 1GIN VOFORIGI 247 "Hab91L0_3035_grid_distribution_feat	() tureParts_	'\n' _CODE" <> ''
15	Save selected files to s distribution occurs → 'Save only selected features	eparate final shapefile containing only thos atures'	se cells	where the
16	CONTINUE ONLY IF USED! Join HabG1-7_3035_grid	HIGHER ACCURACY AS DESCRIBED) UND	ER 8b) IS



19	Select all grid cells where the joined field 'code' is not empty Select by Expression - am_10km Expression Function Editor = + - / * ^ II ("HabG1-7_total_area" > 30		
20	Save selected files to separate final shapefile containing only those cells where the distribution occurs → 'Save only selected features'		
21	Adapt attributes if necessary: Add new fields in attributes and fill 'CODE', 'Region', 'XX' (country ISO2) and 'XX_CS' (conservation status by member state assessment for the specific occurrence) Q HabC3-55_3035_grid_selection :: Features Total: 56, Filtered: 56, Selected: 0 / / / P C CELLCODE EOFORIGIN NOFORIGIN CODE Ref Open field calculator (Ct		
Field Calculator Only update 0 selected feature: Only update 0 selected feature: Create a new field Create a new field Create virtual field Output field name Output field name Output field length 10 Prinction Expression Function Editor Expression Function Editor Field Calculator Prinction Function Editor Function		Field Calculator Only update 0 selected Create a new field Create virtual field Output field name M1 ccording to national assessment and definitions of regions	

2.4.2 Point distribution information

QGIS	
Inputs:	Habitat distribution information: Spec1363_3035.shp (sample dataset created artificially for theoretical distribution of felis silvestris; species code: 1363) Country grid excerpt: am_10km.shp → both in CRS epsg:3035



	Q Join attributes by location
	Parametere Los
	Input layer
	→ am_10km [EPSG:3035]
	Selected features only
	Join layer
	ి Spec1363_3035 [EPSG:3035]
	Selected features only
	Geometric predicate
	✓ intersects □ overlaps
	Contains within
	equals crosses
	touches
	Fields to add (leave empty to use all fields) [optional]
	0 elements selected
	Join type
	Discard records which could not be joined
	C:/babitat_species_distribution/Spec1363_3035_full_join_sho
	→ new snapefile Spec1363_3035_full_join.snp
3	Open new produced dataset and open Attribute Table Spec1363_3035_full_join Zoom to Layer Show in Overview Remove Duplicate Set Layer Scale Visibility Set Layer CRS Set Project CRS from Layer Styles
4	Select all cells for which 'CODE' is not empty
	Q Spec1363_3035_full_join :: Features Total: 530, Filtered: 530, Selected: 7
	Image: CellCODE EOFORIGIN CellCODE EOFORIGIN Select features using an expression
	Q Select by Expression
	Expression Function
	= + - / * "CODE" <> "
	•

5	Right-click on the joined countr	y gri	d (Spec1363_3035_full_join.shp) and sel	ect 'Save	as'
	Spec1363 3035 full join				
	am_10km	P	Zoom to Layer		
			Show in Overview		
			Remove		
			Duplicate		
			Set Layer Scale Visibility		
			Set Layer CRS		
			Set Project CRS from Layer		
			Styles		
			Open Attribute Table		
		/	Toggle Editing		
			Save as		
			a later a cu		
6	Define an output for the habitat	distr	ibution grids for the specific habitat type	and select	C
	'Save only selected features'				
	🔇 Save Vector Layer as			? >	×
	Format ESRI Shapefile			-	·
	File name C:\habitat_species_dist	tributio	n\Spec1363_3035_grid_cells_distribution.shp	≤	
	Layer name				
	CRS EPSG:3035 - ETRS89 /	ETRS-I	LAEA	-	2
					<u> </u>
	Encoding		UTF-8	•	
	Save only selected features				
	Add saved file to map				~
			OK Cancel	Help	
7	Dedicated grid shapefile only of species distribution in this case	conta is pro	ining those grid cells which are intersec oduced.	ting with	the



2.4.3 Linear distribution information



	Vector Raster Database Web Processing Help
1	Geometry Tools
	GPS 🕨 🖡 🛅 🦘 🔿 🏹 🚥 🐪 🏧
	Topology Checker
	Geoprocessing Tools
	Geometry Tools
	Analysis Tools
	Data Management Tools 🔸
	Research Tools 🔸 🔅 Select by location
	the Create and
2	Create a new selection by querying all grid cells which intersect with the linear habitat or which are crossed by the habitat distribution.
	Q Select by location
	Parameters Log
	Select features from
	am_10km [EPSG:3035]
	Where the features (geometric predicate)
	intersect touch
	🗌 contain 🗹 overlap
	disjoint are within
	equal 🗹 cross
	By comparing to the features from
	VHabC3-55_3035 [EPSG:3035]
	Selected features only
	Modify current selection by
	creating new selection
	\rightarrow Run select by location





	Q Field Calculator	Q Field Calculator
	Only update 0 selected features Create a new field Create virtual field Output field name CODE Output field type Text (string) Output field length 10 Pri Expression Function Editor = + - / * ^ II 'C3-55' Fill other fields by head of	 Only update 0 selected Create a new field Create virtual field Output field name MS Output field type Text (Output field length 10 Expression Function = + - / * ^ 'AM
9	Save edits Image: State of the second sec	

Advanced spatial union method between distribution data and grid

The methodology shown here is just one way of creating the habitat/species specific linear distribution dataset incorporating thresholds. There are other ways which will also result in a separate dataset containing the grid cells where only the distribution actually appears to the required extent. For the sake of convenience only one method is shown here.



1	Open 'Intersection' tool			
	Vector Raster Database Web Processing Help			
	Coordinate Capture			
	Geometry Tools			
	GPS • E • •			
	Topology Checker			
	Geoprocessing Tools 🕨 🌞 Buffer			
	Geometry Tools 🕨 🔅 Clip			
	Analysis Tools 🕨 🌞 Convex hull			
	Data Management Tools 🕨 🌞 Dissolve			
	Research Tools Difference			
	Eliminate selected polygo			
	Set line input as first, grid as second input layer and define output path			
3	Add a new field 'length_km' and calculate length of linear segment			

	Q Field Calculator			
	Only update 1 selected featu	res		
	Create a new field			
	Create virtual field			
	Output field name length_km			
	Output field length 10	Precision 3		
	Expression Function Edito	r		
		() he Sear		
	\$length / 1000			
3a)	As multiple linear feature	s might occur in the same cell external processing of the data is		
Suj	needed if more precise inf	ormation is wanted to be used.		
	By using the calculated len	ngth values as they are produced until this step in case of		
	grid in the next step.	the same cell only the length of one line will be joined to the		
	If this accuracy is sufficient	nt proceed with step 4.		
	To further process the dat	a and incorporate the length of all linear features within one cell		
	continue with 3b) below.	1 0		
3b)	To calculate the actual len	gth of all linear features within one cell open the *.dbf file from		
	the shapefile (in this exa	mple HabC3-55_3035_grid_line_intersect.dbf) in a calculation		
	software such as Excel. \rightarrow Create pixet table from	all columns		
	FILE HOME			
	PivotTable Recomm			
	PivotTa			
	\rightarrow select Cellcode as row Code should not differ as	these are fixed for the country respectively the input data which		
	should only represent one type of species or habitat)			
	T FILTERS	III COLUMNS		
		Region		
		E MALUES		
		Z VALUES		
		sum of length_km		
	\rightarrow save as Excel workbook (*.xlsx/*.xls) or other tabular data (please check if QGIS is			

	able to read output format if different from *.xls)		
	\rightarrow HabC3-55_3035_grid_line_intersect_pivot.xlsx		
	\rightarrow load saved tabular data and continue with this instead of 'linear feature' for steps below.		
4	Join linear features to full grid \rightarrow open properties of country grid		
	am 10km		
	Image: Second to Layer		
	Show in Overview		
	Set Layer Scale Visibility		
	Set Layer CRS		
	vyer Order Browser Layers Styles		
	rdinate Capture		
	Toggle Editing		
	Save as		
	Show Feature Count		
	Copy to dipbo		
5	Add new join linking the intersected lines (or preprocessed tabular data) to the grid cells through the Cellcode		
	Join layer V [°] HabC3-55_3035_grid_line_intersect		
	Join field abc CELLCODE		
	Target field abc CELLCODE		
	Cache join layer in virtual memory		
	Create attribute index on join field		
	Dynamic form		
	Editable join layer		
	Custom field name prefix		
	HabC3-55_		
6	Select all grid cells for which linked information from the lines (linear habitat/species distribution occurring) is available and the defined minimum length for linear objects is fulfilled.		

	Q Select by Expression - am_10km	
	Expression Function Editor	
	"Hab3240 ALP" <> "	
	AND	
	"Hab3240_TotalLength" > 5	
7	Save selected cells as dedicated shapefile	
	am 10km	
	Show in Overview	
	Remove	
	Duplicate	
	Set Layer CRS	
	Set Project CRS from Lay	
	ayer Order Browser Styles	
	ordinate Capture 👘 Open Attribute Table	
	/ Toggle Editing	
	Save as	
	Save Vector Layer as ? × Format ESRI Shapefile File name C:\habitat_species_distribution\\HabC3-55_3035_grid_cells_distribution.shp Layer name CRS EPSG:3035 - ETRS89 / ETRS-LAEA	
	Encoding UTF-8	
8	Adapt attributes if necessary: Add new fields in attributes and fill 'CODE', 'Region', 'XX' (country ISO2) and	
	AA_CS (conservation status by member state assessment for the specific occurrence)	
	Real MabC3-55_3035_grid_selection :: Features Total: 56, Filtered: 56, Selected: 0	
	CELLCODE EOFORIGIN NOFORIGIN CODE Rel Open field calc	ulator (Ctrl+I):

Q Field Calculator	Q Field Calculator
Only update 0 sel Create a new fi Create virtual fie Output field name Output field type Output field length	ected feature: Only update 0 selected eld Image: Create a new field ld Create virtual field CODE Output field name MS MS Text (string) Output field length 10 Pri Output field length 10
Expression Fundation Funda	action Editor Expression Function * ^ III = + - / * ^ 'AM * s by hand according to national assessment and definitions of regions

2.4.4 Grid based distribution information

In cases where the national data on species or habitat distribution is represented by grid data where more complex preparation and data processing is required for the transfer of national grid data into the 10 x 10 km grid, as required for the reporting, please refer to the presentations held during the workshop or contact the EEA for further information:

- <u>UK experience of converting mapping data from national grid to EU grid (JNCC)</u>
- Guidance for converting the national distribution data to the Pan-European 10 x10 km Grid