

Amphibians Data Set

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Abstract: The dataset is a multilabel classification problem. The goal is to predict the presence of amphibians species near the water reservoirs based on features obtained from GIS systems and satellite images

Data Set Characteristics:	Multivariate	Number of Instances:	189	Area:	Life
Attribute Characteristics:	Integer, Real	Number of Attributes:	23	Date Donated	2020-07-17
Associated Tasks:	Classification	Missing Values?	N/A	Number of Web Hits:	5434

Source:

Marek Sołtysiak, [marek.soltysiak '@' us.edu.pl](mailto:marek.soltysiak@us.edu.pl), University of Silesia, Faculty of Earth Sciences, Sosnowiec 41-200, Poland;
Dominika Dąbrowska, [dominika.dabrowska '@' us.edu.pl](mailto:dominika.dabrowska@us.edu.pl), University of Silesia, Faculty of Earth Sciences, Sosnowiec 41-200, Poland;

Data Set Information:

The data used was derived from GIS and satellite information, as well as from information gathered from the natural inventories that were prepared for the environmental impact assessment (EIA) reports for two planned road projects (Road A and Road B) in Poland. These reports were mostly used to gather information on the size of the amphibian population in each of the 189 occurrence sites. Road A project concerned part of the planned A1 motorway section in Pyrzowice; the section is located along the northern border of the Silesian Voivodship and is about 75 km long. The field research involved a strip of land with a width of 500 m on both sides of the proposed project area. The field inventory was carried out in 2010 [1] and 2011 [2,3]. The results of these inventories were complemented by Marek Sołtysiak observations, which were conducted between 2014 and 2016 [4]. Finally, the first project included 80 amphibian breeding sites.

Road B inventory was prepared in the vicinity of two variants of the planned Beskidy Integration Way on the Bielsko Biala-Wadowice-Głogoczów section of the S52 motorway. The length of this section of road is approximately 60 km. During the inventory, which was taken in 2010, 125 real and potential amphibian occurrence sites were described in [5]. The methodology of the herpetological inventory included map analysis, literature and archive data analysis, and, then, field observations. As in the first case, the inventory was made in the spring time and consisted of the observation of the occurrence of amphibians in water reservoirs. The research area included a 500 m wide belt for each of the considered variants of the planned road. In order to conduct the final experiments, 109 amphibian occurrence sites were taken into account.

[1] Struzyński, W. [™] Inventory of Occurrence of Amphibians and Reptiles, Including Their Migratory Routes in the Vicinity of the Planned Highway A-1, Section: The Northern Boundary of the Silesian Voivodeship – Pyrzowice; Warsaw Univ. of Life Sci.: Warsaw, Poland, 2010.

[2] Kiczyńska, A.; Falkowski, M.; Jaskuła, R.; Kaczkowski, Z.; Hejduk, J.; Horbacz, A. Natural Inventory for the A1 Motorway Tuszyn – Pyrzowice Section Zawodzie – Pyrzowice; National Foundation for Environmental Protection, Warszawa: Katowice, Poland, 2011.

[3] Ąukaszek, M.; Cabała, S.; Zygmunt, J.; Wojtas, P. Report from the Field Research and Natural Inventory for Documentation: – Construction of the A1 Motorway Tuszyn – Pyrzowice Part II, Section 2 the Northern Boundary of the Silesian Voivodeship – Zawodzie; Environmental Protection Company EKOSOUND: Sosnowiec, Poland, 2011.

[4] Sołtysiak, M.; Dąbrowska, D. Inventory of Occurrence of Amphibians in the Vicinity of the Planned Highway A-1, Section: The Northern Boundary of the Silesian Voivodeship – Pyrzowice; The Upper Silesian Nature Society: Katowice, Poland, 2016.

[5] Guzik, M.; Bań, G.; Kurek, K.; Pończyńska-Konior, G.; Potoczek, M.; Smęka, M.; Snieko, S.; Zydek, B.; Najberek, K.; Gała, A. Inventory of Reptiles, Amphibians and Their Habitats in the Vicinity of the Beskidy Integration Way, Section Bielsko Biala – Głogoczów with Protection Proposals; Institute of Nature Conservation: Kraków, Poland, 2011

Attribute Information:

Provide information about each attribute in your data set.

List of attributes and types:

ID -> Integer
MV -> Categorical
SR -> Numerical
NR -> Numerical
TR -> Categorical
VR -> Categorical
SUR1 -> Categorical
SUR2 -> Categorical
SUR3 -> Categorical
UR -> Categorical
FR -> Categorical
OR -> Numerical
RR -> Ordinal;
BR -> Ordinal;
MR -> Categorical
CR -> Categorical
Green frogs -> Categorical; Label 1
Brown frogs -> Categorical; Label 2
Common toad -> Categorical; Label 3
Fire-bellied toad -> Categorical; Label 4
Tree frog -> Categorical; Label 5
Common newt -> Categorical; Label 6
Great crested newt -> Categorical; Label 7

Name and symbol type description:

- 1) ID -> vector ID (not used in the calculations)
 - 2) MV -> motorway (not used in the calculations)
 - 3) SR -> Surface of water reservoir numeric [m2]
 - 4) NR -> Number of water reservoirs in habitat - Comment: The larger the number of reservoirs, the more likely it is that some of them will be suitable for amphibian breeding.
 - 5) TR -> Type of water reservoirs:
 - a. reservoirs with natural features that are natural or anthropogenic water reservoirs (e.g., subsidence post-exploited water reservoirs), not subjected to naturalization
 - b. recently formed reservoirs, not subjected to naturalization
 - c. settling ponds
 - d. water reservoirs located near houses
 - e. technological water reservoirs
 - f. water reservoirs in allotment gardens
 - g. trenches
 - h. wet meadows, flood plains, marshes
 - i. river valleys
 - j. streams and very small watercourses
 - 6) VR - Presence of vegetation within the reservoirs:
 - a. no vegetation
 - b. narrow patches at the edges
 - c. areas heavily overgrown
 - d. lush vegetation within the reservoir with some part devoid of vegetation
 - e. reservoirs completely overgrown with a disappearing water table

Comment: The vegetation in the reservoir favors amphibians, facilitates breeding, and allows the larvae to feed and give shelter. However, excess vegetation can lead to the overgrowth of the pond and water shortages.
 - 7) SUR1 - Surroundings 1 -> the dominant types of land cover surrounding the water reservoir
 - 8) SUR2 - Surroundings 2 -> the second most dominant types of land cover surrounding the water reservoir
 - 9) SUR3 - Surroundings 3 -> the third most dominant types of land cover surrounding the water reservoir
- Comment: The "surroundings" feature was designated in three stages. First, the dominant surroundings were selected. Then, two secondary types were chosen.
- a. forest areas (with meadows) and densely wooded areas
 - b. areas of wasteland and meadows
 - c. allotment gardens
 - d. parks and green areas
 - e. dense building development, industrial areas
 - f. dispersed habitation, orchards, gardens
 - g. river valleys
 - h. roads, streets
 - i. agricultural land
- The most valuable surroundings of water reservoirs for amphibians are areas with the least anthropopressure and proper moisture.
- 10) UR - Use of water reservoirs:

- a. unused by man (very attractive for amphibians)
- b. recreational and scenic (care work is performed)
- c. used economically (often fish farming)
- d. technological

11) FR - The presence of fishing:

- a. lack of or occasional fishing
- b. intense fishing
- c. breeding reservoirs

Comment: The presence of a large amount of fishing, in particular predatory and intense fishing, is not conducive to the presence of amphibians.

12) OR - Percentage access from the edges of the reservoir to undeveloped areas (the proposed percentage ranges are a numerical reflection of the phrases: lack of access, low access, medium access, large access to free space):

- a. 0â€“25%â€“lack of access or poor access
- b. 25â€“50%â€“low access
- c. 50â€“75%â€“medium access,
- d. 75â€“100%â€“large access to terrestrial habitats of the shoreline is in contact with the terrestrial habitat of amphibians.

13) RR Minimum distance from the water reservoir to roads:

- a. <50 m
- b. 50â€“100 m
- c. 100â€“200 m
- d. 200â€“500 m
- e. 500â€“1000 m
- f. >1000 m

Comment: The greater the distance between the reservoir and the road, the more safety for amphibians.

14) BR - Building development - Minimum distance to buildings:

- a. <50 m
- b. 50â€“100 m
- c. 100â€“200 m
- d. 200â€“500 m
- e. 500â€“1000 m
- f. >1000 m

Comment: The more distant the buildings, the more favorable the conditions for the occurrence of amphibians.

15) MR - Maintenance status of the reservoir:

- a. Clean
- b. slightly littered
- c. reservoirs heavily or very heavily littered

Comment: Trash causes devastation of the reservoir ecosystem. Backfilling and leveling of water reservoirs with ground and debris should also be considered.

16) CR - Type of shore

- a. Natural
- b. Concrete

Comment: A concrete shore of a reservoir is not attractive for amphibians. A vertical concrete shore is usually a barrier for amphibians when they try to leave the water.

- 17) Label 1 â€“ the presence of Green frogs
- 18) Label 2 â€“ the presence of Brown frogs
- 19) Label 3 â€“ the presence of Common toad
- 20) Label 4 â€“ the presence of Fire-bellied toad
- 21) Label 5 â€“ the presence of Tree frog
- 22) Label 6 â€“ the presence of Common newt
- 23) Label 7 â€“ the presence of Great crested newt

The dataset is described in details in:

Marcin Blachnik, Marek SoÅ¸tysiak, Dominika DÄ¸...browska Predicting presence of amphibian species using features obtained from GIS and satellite images.. ISPRS International Journal of Geo-Information 8 (3) pp. 123. MDPI. 2019

Relevant Papers:

N/A

Citation Request:

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