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# Ewolucja odbierania waleni i delfinariów w Polsce w latach 1998–2024

# Evolution of thinking about dolphinariums and cetaceans in Poland in the years 1998–2024

## Abstrakt

Polska jest krajem, w którym nigdy nie trzymano delfinów w niewoli, mimo licznych pomysłów na stworzenie delfinarium. Artykuł przedstawia ewolucyjny, porównawczy obraz odbioru delfinariów, terapii z udziałem delfinów oraz wielorybów w niewoli wśród polskiego społeczeństwa od lat 90. do dzisiaj. Podejmuje się również próbę oceny podstawowej wiedzy Polaków na temat walen, wykorzystując edukacyjną wystawę Galeria Wielorybów, która jest pierwszym i największym tego typu projektem w jakimkolwiek ogrodzie zoologicznym w Polsce. Ta inicjatywa była szczególnie oryginalna i została opracowana przez niewielkie polskie stowarzyszenie edukacyjne o nazwie Castellum Nostrum.

Słowa kluczowe: walenie, delfinarium, ssaki morskie, Morze Bałtyckie, ekologia, delfiny

## Abstract

Poland is a country where dolphins have never been kept in captivity, despite several ideas to create a dolphinarium. The article reviews the evolutionary comparative picture of the reception of dolphinariums, dolphin therapy and whales in captivity among the Polish society in the late 1990's and today. An attempt is also made to assess the basic knowledge about cetaceans among Poles using, an educational exhibition, Whales Gallery, which is the first and largest such project at any zoological garden in Poland. This initiative was especially original and developed by a small Polish educational association, named Castellum Nostrum.

Keywords: cetaceans, dolphinarium, marine mammals, Baltic Sea, ecology, dolphins

## INTRODUCTION

The Baltic Sea is a specific and unique sea – inland, quite shallow, creating a dynamic ecosystem, polluted and very sensitive to pollution (Hakanson, 2010). It belongs to mesohaline – brackish seas [the average composition in terms of salinity (NaCl) is 24.53 g/dm<sup>3</sup>], but its salinity has been systematically decreasing for decades and it is heading towards transformation into a freshwater sea (Meier et al., 2022).

Cetaceans inhabit all the oceans of the world, including the Baltic Sea. The only regularly occurring species is the harbour porpoise, primarily in the western and central Baltic. Occasional visits of dolphins and large whales have been recorded, but these species are not considered resident (Hammond et al. 1995). The Baltic Sea is permanently inhabited by the only representative of Cetacea – the common porpoise (*Phocoena phocoena*) (Braulik et al., 2015). A small subpopulation inhabiting the Baltic Proper is in particularly poor condition, with a current abundance estimate of approximately 491 individuals, including fewer

than 250 mature animals. This subpopulation is classified as *Critically Endangered* by HELCOM and IUCN (Amundin et al. 2022; Carlström et al. 2023; HELCOM 2013). In contrast, the more numerous population inhabiting the Danish Straits and adjacent areas is part of the broader Eastern North Atlantic population, estimated at up to one million individuals and classified globally as *Least Concern* (Braulik et al., 2023; Sharpe & Berggren, 2023). The Baltic Proper population is located at the edge of the species' natural range, which may explain the occurrence of problems typical of marginal populations (Koschinski, 2011; Carlen, 2018).

Following old records and chronicles, we know that there were such species of toothed whales as the common dolphin (*Delphinus delphis*), common bottlenose dolphin (*Tursiops truncatus*), Arctic beluga whale (*Delphinapterus leucas*), white-nosed dolphin (*Lagenorhynchus albirostris*), killer whale (*Orcinus orca*), and even the sperm whale (*Physeter macrocephalus*). Among the non-toothed whales, the following species were recorded: the fin whale (*Balaenoptera physalus*), gray whale (*Eschrichtius*

*tius robustus*), minke whale (*Balaenoptera acutorostrata*), humpback whale (*Megaptera novaeangliae*). It was also confirmed that the „largest of the largest” on our planet, i.e. the blue whale (*Balaenoptera musculus*), entered the Baltic Sea (Pieronek, 1970; Aguayo, 1978; Rolbiecki et al., 2021; Weltrowski, 2023).

Currently, the following cases of cetacean visits have been noticed in Polish waters: in 2015, the Hel Marine Station was notified about a dead individual; entrance no. 67 to the beach in Stegny, a fin whale (17 m long and 23 tons of body weight) in the shallows, which was seen by anglers near Klaipėda a week earlier (Antoniewicz, 2020). In 2018, another discovery on the beach at Kąty Rybackie – a dead, five-meter baleen whale; the species was not determined due to the advanced state of decomposition (Antoniewicz, 2020). On August 28, 2015, a dead, emaciated male longfin whale was found in the waters of the Bay of Gdańsk. In turn, a live humpback whale was noticed and recorded by a resident of Gdynia, 70 km north of the Bay of Gdańsk, on March 21, 2023, which was confirmed by an employee of the MiR (Maritime Fisheries Institute) and the Hel Marine Station (Rolbiecki et al., 2019; Średzinski, 2023). Dolphins are also increasingly observed in our sea waters: white-nosed dolphins (1995, 2019, 2022), bottlenose dolphins (2005, 2015, 2016, 2018, 2019), and common dolphins (2023); the data was made available by Hel Marine Station of the Institute of Oceanography on its website.

People came up with an idea of breeding whales already in the 19th century, and the first captive whales were Arctic beluga whales (*Delphinapterus leucas*). However, the first commercial dolphinarium was established in Florida as late as in 1938 (Carandell, 2022). It was quickly realized that the bottlenose dolphin (*Tursiops truncatus*) ideally suited such conditions; relatively safe for people, very curious, easy to train, and most importantly – looked so nice with a beak – as if always smiling (Defran and Pryor, 1980). Many species of cetaceans have been approached with varying results; white-sided dolphins (*Leucopleurus acutus*), Risso's dolphins (*Grampus griseus*), tucuxi (So-

*talio fluviatilis*), Amazon river dolphins or botos (*Inia geoffrnessis*), short-headed killer whales (*Orcaella brevirostris*), killer whales (*Orcinus orca*), finless porpoises (*Neophocaena phocaenoides*), common porpoises (*Phocoena phocoena*), pygmy killer whales (*Pseudorca crassidens*), Commerson's dolphins (*Cephalorhynchus commersonii*), pilot whales (*Globicephala macrorhynchos*) or common dolphins (*Delphinus delphis*) (Kritzler, 1952; Mignucci-Giannoni, 1998; Daoquan et al., 2006; Yoshida et al., 2014; Svarachorn et al., 2016; Lott & Williamson, 2017).

A dolphinarium is a water tank or a set of them (with the desired salinity, pH and temperature), indoor or open, intended for temporary maintenance and breeding of dolphins and/or porpoises and other cetaceans, with stands for the audience (Przyłucki, 1998; Joseph et al., 2010). There is no clear distinction between strictly commercial dolphinariums and dolphinariums that conduct rehabilitation or scientific research. According to calculations by EAAM (European Association for Aquatic Mammals, which brought together 24 centers by 2013), European dolphinariums were visited annually by over 21 million people (EAAM, 2013; Verband Deutscher Zoodirektoren e.V., 2013).

Also in Poland, the construction of a dolphinarium has been considered several times. The first ideas were already brewing in Poznań in the so-called „New ZOO” in the concept of „Zoorama” in the 1970s (Przyłucki, 1998). In the next decade, the Russians tried to build a dolphinarium in Warsaw ZOO, but its director did not agree due to possible political interference in the functioning of the garden (oral information from the former director of Warsaw ZOO – Rembiszewski, 2008). Subsequent ideas included two locations, Tarnowskie Góry (2006) and Mszczonów (2015).

The aim of the work is to analyze the public perception of cetaceans in Poland between 1998 and 2024, and to determine its variability over 25 years, taking into account common knowledge about cetaceans, and keeping dolphins in captivity, using as a tool, among others, original popular science exhibitions: „Freshwater dol-

phins and porpoises. The most endangered cetaceans in the world" held in Poznań, and „Do pink dolphins exist?" in Wrocław. It is worth noting that research on public perception of cetaceans in Poland is relatively rare. Although this study is one of the first comprehensive attempts to examine this issue over an extended period, earlier important work includes the doctoral dissertation of Tomasz Zarzycki (2012), which estimated the ecological and socio-economic value of biodiversity in the Gulf of Gdańsk. Furthermore, Zarzycki et al. (2012) analyzed willingness to pay (WTP) for harbour porpoise conservation in Poland on a large statistical sample, highlighting cultural factors affecting marine species conservation values across different populations. These previous studies provide a valuable foundation for the current research and underscore the relevance of exploring public attitudes toward cetaceans.

## MATERIAL AND METHODS

In 1998, as part of a diploma thesis titled *Possibilities of breeding the bottlenose dolphin in Poland, Tursiops truncatus Montagu 1821* (Przyłucki, 1998), information was collected, among other sources, based on a survey method about the public's attitude to the project of establishing a dolphinarium and basic knowledge about marine mammals. It was the first master's thesis on dolphins in captivity in Poland, containing breeding, biological, sociological and construction aspects.

Using a questionnaire (open and closed questions), surveys were collected among:

- inhabitants of five large Polish cities: Gdańsk – 50 people, Poznań – 164 people, Wrocław – 50 people, Łódź – 27 people, Warsaw – 50 people, in total – 341 respondents.

The selection of respondents was random, the aim was to obtain opinions of the public in various cities on the construction of a dolphinarium in Poland while attempting to analyze basic knowledge about marine mammals;

- parents of children with mental disabilities from two centers: „Żurawinka" 5/7

Żurawinowa St., Poznań, „Ejlan" – 11d/2 Strumykowa St., Zielona Góra. A total of 42 people commented on the proposal to subject their sick children to dolphin therapy;

- directors of all Polish zoos at that time: located in Kraków, Katowice, Opole, Wrocław, Poznań, Bydgoszcz, Gdańsk, Płock, Łódź, Zamość, and Warsaw, as specialists in the breeding and breeding of animals that are not part of our native fauna;
- students visiting the exhibition entitled „Marine mammals" at the Collegium Maximum of the Agricultural University of Poznań; 1–15 December, 1997. Total: 141 people;
- children of grades 1–4 in three randomly selected primary schools: Primary School No. 50, Os. Stare Zegrze 1, Poznań, Primary School No. 7, 14 Galileusza St., Poznań, Primary School in Szoldry, Brodnica. A total of 367 children.

The children in these schools took part in the following experiment. During biology/environment lessons, teachers wrote on the board four names of popular animals seen in zoos, with the last, fifth position being dolphin. The children were asked one question: „Which of the animals listed here would you especially like to see, pet, ... maybe make friends at the zoo?" Each child had the right to cast only one vote for one animal of their choice. All votes were recorded by the teacher along with data about the number of children present in the classroom on the day of the experiment, the number of children taking part in the experiment; statements justifying the choice of the dolphin were also recorded.

Statistical analysis of the above research, using a diagnostic survey method, was based on the Spark v. 1.41 program.

In 2021–2022, data was collected during research conducted at the popular science exhibition at the Poznań Palm House „Freshwater dolphins and porpoises. The most endangered cetaceans in the world" assessed the basic level of knowledge about cetaceans, as well as the way the exhibition itself was perceived. The survey method was used – anonymous in paper form, entries in the guest book and visitors'

own observations. Surveys and observations were conducted over a two-month period (October 2021 – December 2021), and the set of guestbook entries was collected between September 17, 2021 and June 15, 2022.

In 2023, for the exhibition „Do pink dolphins exist? (as part of the first „Whale Gallery” in Poland in the Africarium in Wrocław ZOO), classes were created as part of one of the garden’s missions, namely education. Educators from Wrocław ZOO conducted educational workshops called „Do pink dolphins exist?”, which were addressed to grades 1–8 and secondary school students. These classes were added in December 2022, and during the teaching period until June 2023, data was collected and analyzed (number of all classes completed, number of workshops) regarding orders for educational classes among the available 14 thematic blocks.

As part of a study on contemporary public perception of cetaceans in Poland, an online survey was conducted in February and March 2024, which aimed to explore various aspects of public knowledge, attitudes and opinions. The survey was published on the website of the *Castellum Nostrum* Association on social media. It contained closed, semi-open and open questions regarding basic knowledge about cetaceans, their protection, an educational and thematic exhibition – „Do pink dolphins exist?” in Africarium in Wrocław ZOO. Google tools with available automatic statistical processing were used to conduct the survey.

## RESULTS

### *Analysis of data from 1998*

Taking the group of 341 people covered by the survey as 100%, 48.09% of the research was conducted in Poznań, 14.66% in Gdańsk, Wrocław and Warsaw, and 7.91% in Łódź. The randomly selected group of respondents included 55.42% women and 44.58% men. The largest group were people in the age range up to 24 years old – 53.07%, from 25 to 44 years old – 29.03%, and the remaining 17.88% were people over 45 years of age. 21.99% of respond-

ents had higher education, 53.95% had secondary education, 10.85% possessed vocational education and, 12.31% had primary education. Education was not determined for 0.87% of respondents (Table 1).

The first source of information about dolphins for 52.78% of the respondents was a book, and for 44.22% a television while 4.98% of respondents learned about these marine mammals for the first time through cinema, radio and magazines. For 98.53% of respondents, the bottlenose dolphin is an animal that inspires trust and sympathy.

A construction of a dolphinarium in Poland was supported by 80.64% of people, with the greatest approval rate among inhabitants of Poznań (85.97%) and Warsaw (84%). 14.66% of the surveyed opposed the existence of a dolphin center in Poland; the highest negation rates were recorded in Gdańsk (24%) and Łódź (22.22%). 4.69% of respondents refrained from commenting on the creation of a dolphinarium. According to 47.5% of people, the dolphinarium should be a separate center built outside the city, while 39.2% are convinced that the most appropriate place is the zoo area. 13.19% of respondents had no idea as far a location goes, and 35.19% did not decide to choose a region of the country where tanks for bottlenose dolphins could be built while 34.31% opted for the central part of the country, and 30.49% for the Baltic coast.

As far as the question „Are dolphins mammals or fish?” goes – 96.37% of respondents chose a mammal, and 3.22% decided that dolphins are fish. The porpoise, the most common Polish whale, was known by 41.05% (Gdańsk – 60%, Warsaw – 48%, Łódź – 40.74%, Poznań – 35.36%, Wrocław – 34%). More than half of the respondents (58.94%) had never heard of the common porpoise.

For the next question, „Are any marine mammals kept in Polish zoos?”, only 50.43% answered correctly (in Gdańsk – 64% respondents). Incorrect statements were most frequent in Poznań (58.53%).

Assuming that the number of respondents who supported the creation of a dolphinarium

in Poland is 100%, 82.66% of voters have a university diplomas, 80.97% have completed secondary school, 78.37% of vocational school and

78.57% of primary school. Among people with an unknown level of education, 66.66% supported keeping dolphins in captivity (Table 1).

**Table 1.** Summary of data from surveys of randomly selected residents of five cities

DATA	N / %	Poznań	Wrocław	Gdańsk	Warszawa	Łódź
<b>Number of respondents</b>	341 / 100	164 / 48.09	50 / 14.66	50 / 14.66	50 / 14.66	27 / 7.91
<b>Number of women</b>	189 / 55.42	93 / 56.7	29 / 58	30 / 60	24 / 48	13 / 48.14
<b>Number of men</b>	152 / 44.57	71 / 43.29	21 / 42	20 / 40	26 / 52	14 / 51.85
<b>Education</b>						
• higher	75 / 21.99	23 / 14.02	18 / 36	8 / 16	17 / 34	9 / 33.33
• secondary	184 / 53.95	108 / 65.85	24 / 48	26 / 52	18 / 36	8 / 29.62
• professional	37 / 10.85	9 / 5.48	4 / 8	12 / 24	9 / 18	3 / 11.11
• basic	42 / 12.31	24 / 14.63	4 / 8	4 / 8	5 / 10	5 / 18.51
• undetermined	3 / 0.87	0 / 0	0 / 0	0 / 0	1 / 2	2 / 7.40
<b>AGE:</b>						
• >24	181 / 53.07	114 / 69.51	23 / 46	20 / 40	14 / 28	10 / 37.03
• 25-44	99 / 29.03	34 / 20.73	19 / 38	15 / 30	19 / 38	12 / 44.44
• <45	61 / 17.88	16 / 9.75	8 / 16	15 / 30	17 / 34	5 / 18.51
<b>First encounter with a dolphin:</b>						
• book	180 / 52.78	50 / 30.48	36 / 72	21 / 42	46 / 92	10 / 37.03
• TV	144 / 42.22	105 / 64.02	14 / 28	21 / 42	19 / 38	12 / 44.44
• other/radio/ Cinema	17 / 4.98	9 / 5.48	0 / 0	8 / 16	17 / 34	5 / 18.51
<b>Do dolphins inspire trust and sympathy</b>						
• YES	336 / 98.53	163 / 99.39	49 / 98	50 / 100	47 / 94	27 / 100
• NO	5 / 1.46	1 / 0.6	1 / 2	0 / 0	3 / 6	0 / 0
<b>Do you support the dolphinarium in Poland?</b>						
• YES	275 / 80.64	141 / 85.97	37 / 74	36 / 72	42 / 84	19 / 70.37
• NO	50 / 14.66	15 / 9.14	10 / 20	12 / 24	7 / 14	6 / 22.22
• No opinion	16 / 4.69	8 / 4.87	3 / 6	2 / 4	1 / 2	2 / 7.4
<b>Localization:</b>						
• ZOO area	134 / 39.29	37 / 22.56	26 / 52	21 / 42	32 / 64	18 / 66
• outside the city	162 / 47.5	114 / 69.51	12 / 24	18 / 36	13 / 26	5 / 18.51
• no opinion	45 / 13.19	13 / 7.92	12/24	11 / 22	5 / 10	4 / 14.81
<b>Region of the country:</b>						
• Baltic coast	104 / 30.49	25 / 15.24	13 / 26	27 / 54	21 / 42	18 66.66
• centrum	117 / 34.31	85 / 51.82	11 / 22	0 / 0	16 / 32	5 / 18.51
• no opinion	120 / 35.19	54 / 32.92	26 / 52	23 / 46	13 / 26	4 / 14.81
<b>Dolphin is:</b>						
• mammal	330 / 96.37	161 / 98.17	47 / 94	50 / 100	48 / 96	24 / 88.88
• fish	11 / 3.22	3 / 1.82	3 / 6	0 / 0	2 / 4	3 / 11.11

**Table 1.** Summary of data from surveys of randomly selected residents of five cities (cd)

DATA	N / %	Poznań	Wrocław	Gdańsk	Warszawa	Łódź
Are there marine mammals in Polish zoos?						
• YES	172 / 50.43	68 / 41.46	29 / 58	32 / 64	28 / 56	15 / 55.55
• NO	169 / 49.56	96 / 58.53	21 / 42	18 / 36	22 / 44	12 / 44.44
Have you heard of the porpoise:						
• YES	140 / 41.05	58 / 35.36	17 / 34	30 / 60	24 / 48	11 / 0.74
• NO	201 / 58.94	106 / 64.63	33 / 66	20 / 40	26 / 52	12 / 44.44

In 1998, there were 11 zoological gardens in Poland. Eight directors (72.72%) responded to the mailed surveys. For all zoo directors, the dolphin was a nice and trustworthy animal. Six directors (75%) supported the idea of breeding and/or breeding dolphins (bottlenose dolphins) in Poland, as well as using them in therapy with sick children (dolphin therapy). Two directors, from Kraków and Wrocław, were in opposition. In the first case, no justification was given, and in the second case, the most important obstacle was construction and maintenance costs.

Directors from Katowice, Poznań, Płock, Warsaw and Zamość (71.42%) believed that the dolphinarium should be built in the ZOO. The directors from Warsaw and Łódź suggested an individual center outside the zoo. According to respondents from Płock, Łódź and Wrocław, northern Poland was a suitable area for construction, and directors from Zamość, Warsaw, Poznań and Katowice indicated large Polish cities. They justified their decision by the possibility of a larger number of visitors in the dolphinarium (Table 2).

**Table 2.** Summary of data obtained from ZOO directors

ZOO directors	Do dolphins inspire your trust and sympathy?	Do you support the construction of a dolphinarium in Poland?	Localization: ZOO / PARK	Polish region
Kraków	Yes	No	without an opinion	without an opinion
Katowice	yes	No data	ZOO	Big city
Opole	No data	No data	No data	No data
Wrocław	Yes	No	PARK	Big city
Poznań	Yes	Yes	ZOO	Big city
Bydgoszcz	No data	No data	No data	No data
Gdańsk	No data	No data	No data	No data
Płock	Yes	Yes	ZOO	Coast
Warszawa	Yes	Yes	ZOO	Big city
Łódź	Yes	Yes	PARK	Coast
Zamość	Yes	Yes	PARK	Centrum

„The Dolphin” photographic exhibition, which took place as part of the diploma thesis at the Collegium Maximum Poznań University of Life Sciences in 1998 and lasted 2 months, allowed to collect the opinions of 141 students of the Poznań University of Life Sciences (84 women and 57 men). Asked the question: „Do you think a dolphinarium should exist in Poland?” 70.21% of students answered „yes” (75% of all women and 63.15% of all men), 14.89% wrote „no” and 14.89% refrained from answering. 68% of the surveyed students had heard about the porpoise. 98.87% of them believed that all whales and dolphins are seriously endangered. Among the 141 people visiting the exhibition, only 33 (23.4%) had seen dolphins in dolphinariums and natural habitats. Five students visited the dolphinarium in Soltau, Germany, 15 were in the Harederwijk center, the Netherlands, one in Varna, Bulgaria, and one in Eilat, Israel.

Three students have had the opportunity to observe dolphins in their natural environment in the Adriatic Sea, seven in the North Sea and one in the Baltic Sea. Of the 33 people mentioned above, 21 (63.63%) were convinced that the dolphinarium should be created. Six students (18.18%) were against it and other six (18.18%) had no opinion. All people who abstained or opposed visited two dolphinariums: Varna and Soltau and swam in the Adriatic Sea. A 367 children from three primary schools answered the question What „position” would a dolphin be in compared to such popular animals in zoos as a lion, a monkey, an elephant, a giraffe?

In Primary School No. 7 in Poznań 149 children (40.59%) from grades 1–4 took part in

the study; Primary School No. 50 in Poznań 137 (37.32%) fourth-grade students while in Primary School in Szoldry 81 (22.02%) children voted from grades 1–4.

In the first school on the list, 117 children (78.52%) voted for the dolphin, in the second school 101 (73.72%), and in the third school 39 (48.14%). A total of 257 students voted for the dolphin, which was what the children wanted to see, touch and admire at the zoo. Second place, although very distant, was taken by the lion, – 58 votes (15.8%), third was the elephant with 18 votes (4.9%), fourth was the monkey with 21 votes (5.72%), and the last one was the giraffe with 13 votes (3.54%) (Table 3).

The students justified their choice of the dolphin with the following statements:

- „Because it is a wonderful animal, an acrobat, a good friend of the man”
- „They are very pretty, they swim perfectly, they are talented animals”
- „Dolphins have a smile on their face”
- „Dolphins especially like children”
- „Because dolphins are nice to the touch”
- „It has nice skin, it doesn't bite”
- „Because it's funny and likes kids”
- „I would learn to swim with it, and if I drowned, it would save me.”
- „Dolphins don't attack like sharks”
- „It has a sweet look”
- „It has the greatest intelligence among animals”
- „It can do all kinds of tricks”
- „It likes playing with people”
- „It's still laughing”

**Table 3.** Summary of data obtained in three primary schools

School	PS no 7	PS no 50	PS Szoldry	N / %
Number of children participating in the study	149 / 40.59	137 / 37.32	81 / 22.07	367 / 100
Number of votes cast for the dolphin	117 / 78.52	101 / 73.72	39 / 48.14	257 / 70.02
Other animals:				
• lion	13 / 8.72	19 / 13.86	26 / 32.09	58 / 15.80
• monkey	7 / 4.69	9 / 6.56	5 / 6.17	21 / 5.72
• elephant	7 / 469	5 / 3.64	6 / 7.4	18 / 4.9
• giraffe	5 / 3.35	3 / 2.18	5 / 6.17	13 / 3.54

In two centers, „Żurawinka” – Poznań and „Ejlan” – Zielona Góra, 32 (76.19%) and 10 (23.8%) questionnaires, respectively were collected, completed by parents of children with diseases of the nervous system. 57.14% of respondents were women, 42.85% – men. Two people were in the age group of up to 24 years (4.76%), 34 respondents (80.95%) were in the age group 35 – 44, and 6 respondents (14.28%) were over 44 years of age. Their education was as follows: higher: 21.42% of respondents, secondary: 25%, vocational: 19.04%. For 30.95%, the first source of information about dolphins was a book while for 69.04% a television. Questions about generating sympathy and trust by dolphins and support for the construction of a dolphinarium in Poland are characterized by unanimity among respondents. 100% voted „yes”. According to 50% of respondents, the dolphinarium should be built in a secluded place outside the city, 47.61% were in favor of the ZOO area, and 2.38% of respondents had no opinion. 78.57% would like to have dolphins in Poznań, 2.38% in Zielona Góra, 9.52% on the Baltic coast, and 9.52% refrained from commenting. For 97.61% of respondents, the dolphin is a mammal, but only 19.04% have ever heard of a porpoise, while only 57.14% were sure that marine mammals are kept in Polish zoos.

#### ANALYSIS OF DATA FROM THE EXHIBITION „FRESHWATER DOLPHINS AND PORPOISES. THE WORLD'S MOST ENDANGERED WHALES”

During the exhibition „Freshwater dolphins and porpoises. The most endangered whales in the world”, which took place in the Poznań Palm House from September 17, 2021 to June 15, 2022, visitors had the opportunity to leave entries in the chronicles. During this time, 7,082 entries appeared in eight books. They were replaced every month and were publicly available during the entire time of the exhibition. On average, 4.5 words were included in one entry. Additionally, emoticons (49.84% of entries), a date (44.46% of entries), and drawings (14.54%) were posted (Fig. 1). Moreover,

6.52% of notes were in a foreign language (English, German, Ukrainian, Turkish, Czech).

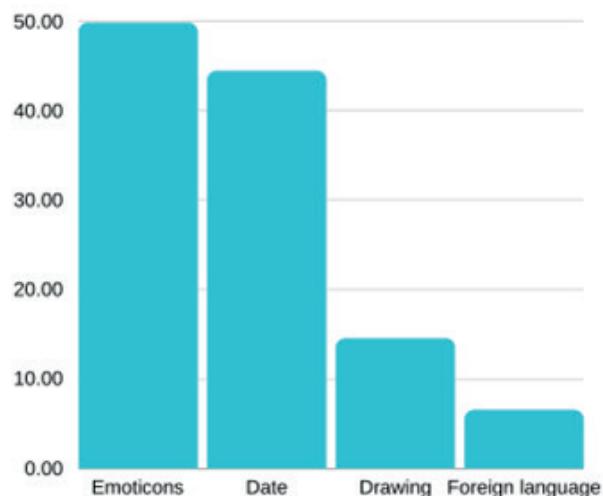


Fig. 1. Types of information included in entries in the guest book, exhibition at the Poznań Palm

The entries were analyzed in terms of the emotions that accompanied the guests. They were divided into 4 categories: positive emotions, negative emotions, no emotions and sarcasm (Fig. 2). 64.49% of the content was positive and only 0.73% was negative. In the remaining texts, specific emotions could not be identified (30.7%) or sarcasm was used (4.08%).

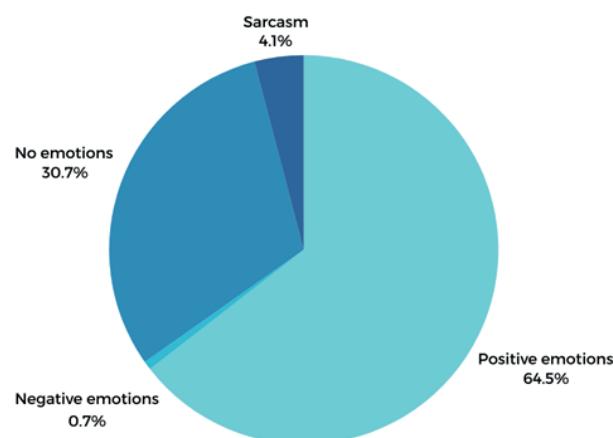
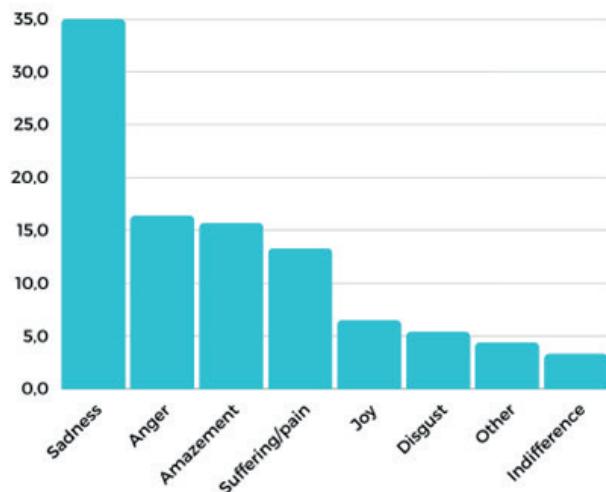


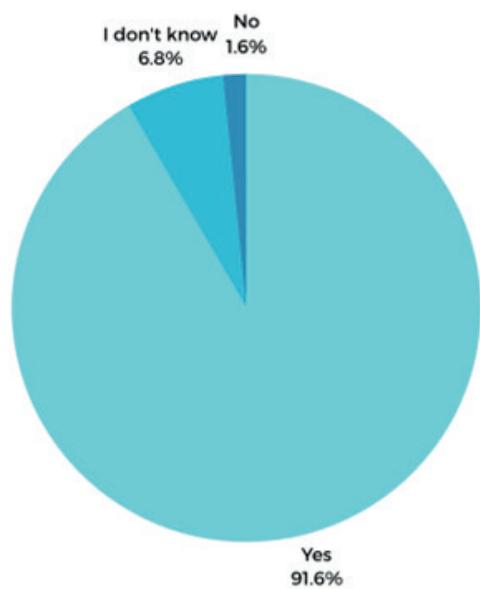
Fig. 2. Types of emotions (or lack thereof) in entries in the guest book, exhibition at the Poznań Palm House

The results show that the exhibition about dolphins and porpoises aroused the interest of many guests and evoked various feelings in them, prompting them to leave their thoughts in the form of an entry in the guest book. More than 50% of the visitors were guided by positive emotions. Negative entries accounted for less than 1%.

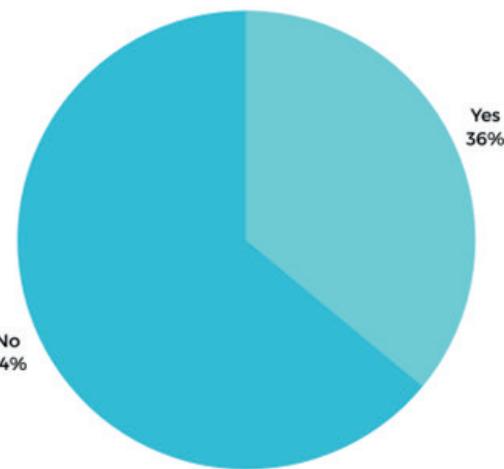
For two months (October–November) during the exhibition, anonymous paper questionnaires were placed next to the guest book. They were completed by 322 people. Most women born between 1996 and 2004 responded to the survey. The most frequently chosen emotion in the survey was sadness (35%) (Fig. 3). More than half of people declared that they did not previously know about the existence of river dolphins, and additionally, respondents agreed that there should be more education on this topic (Fig. 4). Almost every respondent noted that it was worth visiting the exhibition and that it provided valuable knowledge to them. Only 37% of respondents have visited a dolphinarium at least once in their lives, yet 49% are still supporters of this type of places (Figs. 5 and 6).



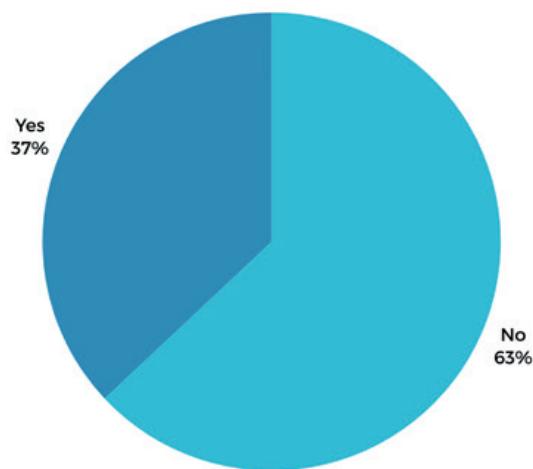
**Fig. 3.** Emotions during visiting the exhibition (N = 322 people), respondents could choose more than one emotion



**Fig. 4.** „Do you think there should be more education and public knowledge on the topic covered by the exhibition?”



**Fig. 5.** “Did you previously know about the existence of river dolphins?”



**Fig. 6.** „Have you ever visited a dolphinarium?”

#### ANALYSIS OF DATA FROM EDUCATIONAL CLASSES CONDUCTED AT WROCŁAW ZOO

Educational activities about cetaceans have been very popular among children and/or teachers from the very beginning. “Do pink dolphins exist?” constituted 30.15% of all lessons conducted. Most lectures with students took place under the topic „Close encounters with monkeys” (39.95%). However, it should be taken into account that classes about monkeys are conducted in the field, through walks near animal enclosures, and classes about dolphins are conducted in the form of workshops in an educational room. Groups of visitors are much more willing to actively explore outdoors (53.92%), which is a change from typical school lessons. However, if we compare the number of workshops on individual topics, „Do pink dolphins exist?” are in the first place (65.43% of all classes in the classroom) (Table 4).

In addition, Table 5 presents the number of completed educational workshops on specific topics at ZOO Wrocław, during the period from December 2022 to June 2023, highlighting that “Do pink dolphins exist?” was the most frequent topic in workshops (123 out of 188 workshops).

**Table 4.** Number of completed educational classes on specific topics at Wrocław ZOO, December 2022–June 2023

Class name	Number of all educational activities completed
Close encounters with monkeys	163
Do pink dolphins exist?	123
Senses in the animal world	36
Endangered species	25
Travel around Poland	19
Predators of Europe	12
Animals of Asia	12
A journey through Africa	7
From the Andes to the Amazon	4
Tales from the African savannah	3
The world of invertebrates	3
Relics of the dinosaur era	1
Life on the savannah	0
Amphibians – life on the edge	
	Total: 408

**Table 5.** Number of completed educational workshops on specific topics at ZOO Wrocław, in the period from December 2022 to June 2023.

Class name	Number of all educational activities completed
Do pink dolphins exist?	123
Senses in the animal world	36
Travel around Poland	19
A journey through Africa	7
Tales from the African savannah	3
Total	188

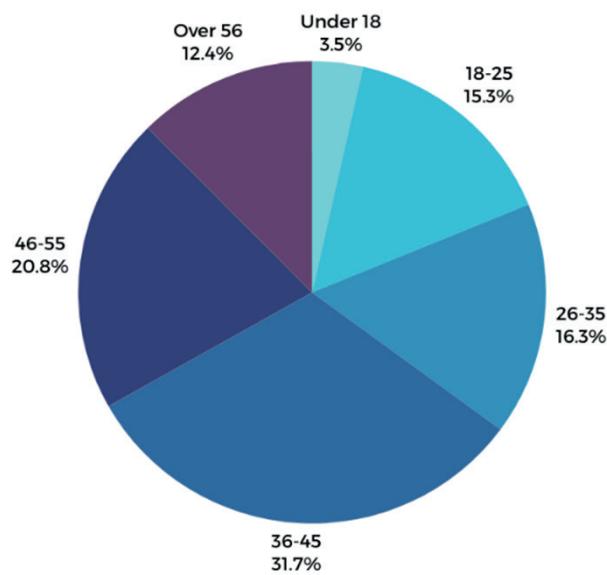
Furthermore, Table 6 shows the breakdown of “Do pink dolphins exist?” classes by school agegroups, where the majority of classes were conducted for younger students (grades I–III).

**Table 6.** Number of completed classes “Do pink dolphins exist?” for individual school groups.

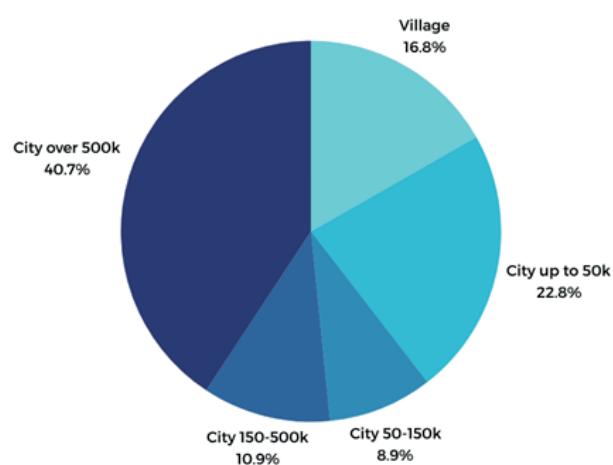
Age group	Number of all educational activities completed	%
I–III	83	67.48
IV–VIII	38	30.89
secondary schools	2	1.63

#### ANALYSIS OF THE ONLINE SURVEY (JANUARY – FEBRUARY 2024)

In an online survey between January 15, 2004 and February 15, 2024, 202 respondents took part. The largest group were people aged 36–45, namely 64 people (31.7%), and the least numerous group were people under 18 years of age, namely 7 (3.5%). 82 residents of large cities (over 500,000 inhabitants) responded, i.e. over 40% (Figs. 7 and 8).



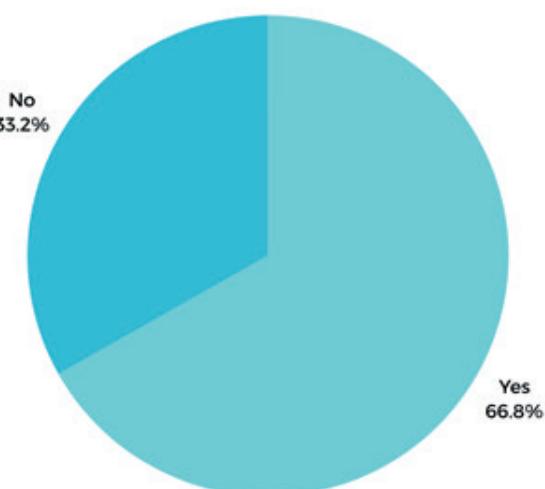
**Fig. 7.** Age structure of respondents



**Fig. 8.** Respondents taking part in the survey by size of city or village

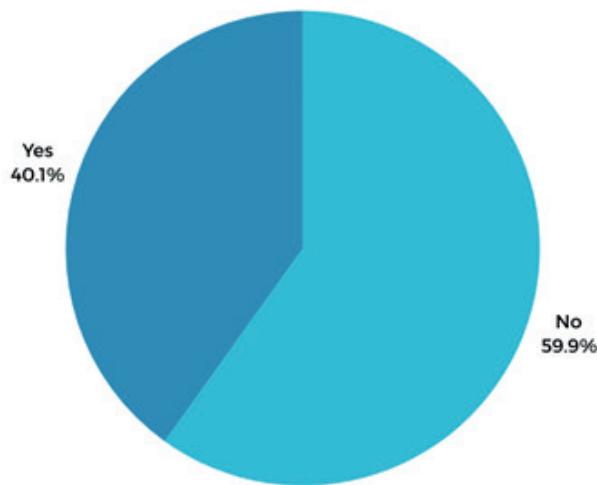
Among respondents asked about the permanent presence of cetacean species in the Baltic Sea, 135 people (66.8%) answered yes, and 67 people (33.2%) gave a negative answer (Fig. 9).

Figure 9 shows that among the people confirming the presence of cetaceans in the Baltic Sea, 109 answered yes about the presence of porpoises in our waters. Dolphins (7 respondents), seals (6 respondents) and occasionally „whales” (3 respondents) were also mentioned.



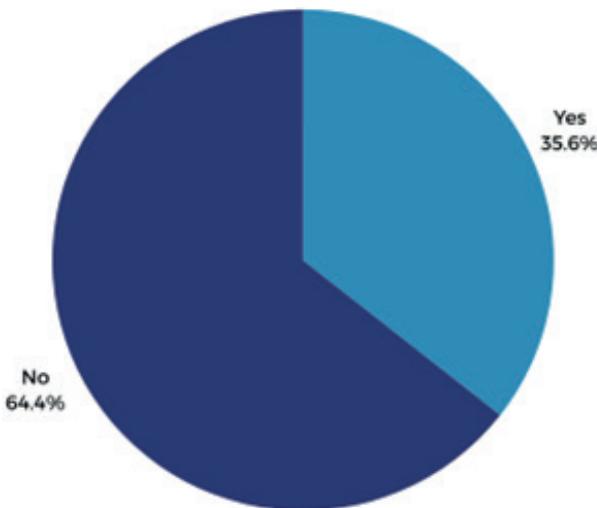
**Fig. 9.** Percentage breakdown of respondents about cetaceans in the Baltic Sea

The question concerning distinguishing porpoises from dolphins, which is important in terms of assessing basic knowledge about cetaceans, was answered correctly by 81 respondents (40.1%), and 121 people (59.9%) gave an incorrect answer (Fig. 10).



**Fig. 10.** Percentage of respondents supporting the systematic affiliation of the porpoise

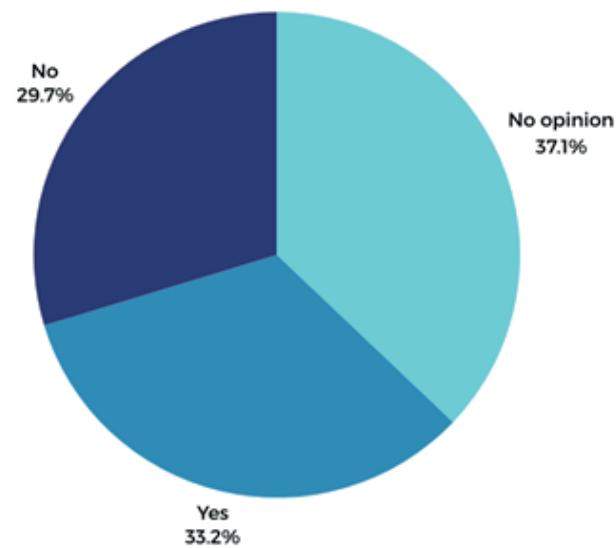
72 people examined in a dolphinarium were 35.6% of the respondents, and 130 people had never visited such a center, i.e. over 64% (Fig. 11).



**Fig. 11.** Percentage of respondents as to their visits in the dolphinarium

Respondents had different opinions concerning current functioning of centers keeping cetaceans in captivity. It was shown that both some agreement and great diversity of number of 75 respondents 75 believe that they should operate, 25 had no opinion on, and 28 respondents (13.4%) gave a descriptive – individual answer; negative opinions dominated, with some justification, e.g. only in the case of species protection, as a rehabilitation center for these animals, where animals have already been born in captivity, no training, provided that their welfare is ensured.

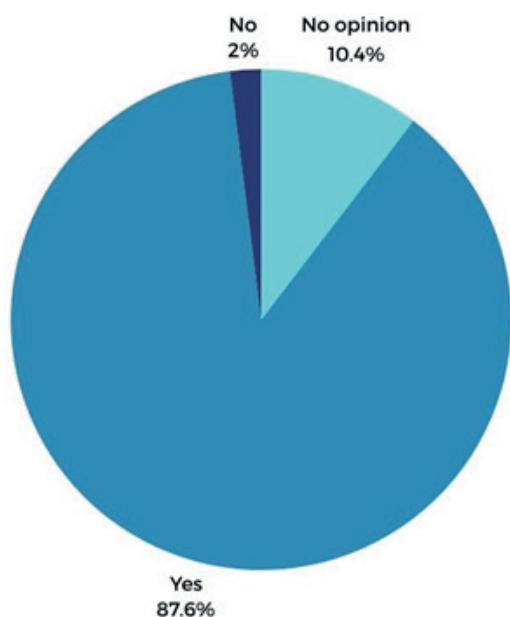
Another comparative factor taken into account is the attitude of society towards dolphin therapy conducted in closed centers (conditions of complete captivity). Just over 37% (75 people) responding to the survey had no opinion on this question, and 33.2% (67 respondents) believed that this form of therapy should be conducted. In turn, 29.7% (60 people) expressed opposition to such zootherapy (Fig. 12).



**Fig. 12.** Percentage differences among respondents regarding dolphin therapy in dolphinariums

Opinion on the first permanent exhibition of this type, „Dry Walarium”, held in the Afriarium of Wrocław ZOO from 2021, was also

examined. Almost 88% (175 respondents) were convinced that such an exhibition can have a positive impact on visitors to the exhibition called „Do pink dolphins exist?” at the ZOO, 20 people (10.4%) did not express an opinion, and 7, (i.e. 3.5 %) said that such expositions had no effect (Fig. 13).



**Fig. 13.** Respondents' opinions regarding the concept of a permanent exhibition „Whale Gallery” on cetaceans in Wroclaw ZOO

## DISCUSSION

Considerable popularity of dolphins in Poland in the late 1990s is unquestionable: 75% of Polish zoo directors, 80% of respondents in five large cities, over 70% of surveyed students of the Poznań University of Life Sciences were in favor of creating a dolphinarium in our country. Also, 70% of surveyed primary school children chose the dolphin among other popular animal species at the zoo that they would like to see, pet, and even make friends with.

Poland in the 1990s is a country of significant economic changes, it is undergoing important transformations towards a capitalist economy, which was facilitated by the wider development of the private sector (Lipton, 1990; Migala, 2014).

Positive changes are noticed in Polish zoos. For example, in 1992, the European Zoo Association (EAZA) accepted Poznań Zoo into its ranks in recognition of its breeding achievements, and already in 1999, Poznań ZOO became a member of the prestigious organization – WAZA – the World Association of Zoos and Aquariums (WAZA 2023). In 1995, the first modern Nocturnal Animals Pavilion in Poland was opened – also in Poznań (Józefowicz and Ratajszczak, 1996).

It seems obvious that Polish zoological gardens have started to strive for equal opportunities and to reach the Western European level (Zubkowicz, 2017). This may explain the favorable attitude of the directors of Polish zoos at that time to the idea of creating a dolphinarium, which could increase the attendance.

Nowadays, we observe a global trend and social movements to extinguish centers that keep species of small and medium-sized whales. The State Council for Nature Conservation of August 13, 2015 negatively assessed Polish attempts to build a dolphinarium. The Council raised two aspects, namely the possibility of keeping dolphins in Poland, on the one hand, in the light of the provisions on species protection, and, on the other hand, in the light of the provisions of the international CITES convention and related EU regulations on cross-border trade in protected species. The opinion reads as follows: ... in Polish conditions (lack of access to a relatively warm sea with appropriate salinity, with the possibility of allocating large spaces for dolphins kept in controlled conditions), the only species of cetacean for which it is potentially possible to provide appropriate keeping conditions, is the common harbor porpoise [...], provided that the detention is intended to be temporary and will be carried out for the purpose of treatment, rehabilitation and reintroduction to the natural environment of sick, injured or weakened specimens. In the case of other species [...], keeping them in dolphinariums located on the mainland cannot be considered as meeting the condition of providing them with appropriate conditions (adapted to biological requirements)... (Botev, 2016). The

level of basic knowledge about marine mammals in our country during the first period of the study was alarming. Dolphins were known to most of the society from books and television, and only half of the respondents knew that marine mammals were kept in Polish zoos (those were the times of the developing Internet and social media), and the result was the knowledge of the porpoise (58% of respondents had never heard of this small and endangered Baltic whale) prompted the initiation of considerable educational work.

The results of research carried out at the Poznań Palm House (2021–2022; the first Polish exhibition on porpoises and river dolphins) clearly showed great interest in the subject among visitors to the Palm House. In less than a year, it was visited by approximately 120,000 people. The surveys showed that more than half of the visitors had positive emotions, emphasizing the need to popularize this topic. The advantages of the exhibition were emphasized, but still more than half of the respondents had never heard of river dolphins, and at the same time, 92% of the respondents expressed the need to increase education and access to knowledge about cetaceans and the problems it raises. The dominant emotions were sadness, anger, astonishment, especially among adults and young people. It should be noted that visitors to the exhibition most often focused on 1:1 models of dolphins and porpoises, and were less likely to read the educational boards.

Taking into account the still low knowledge about cetaceans, current freedom trends, ethical considerations, breeding experiences and the increasingly visible strictly commercial nature of dolphinariums' activities, „Suche Walarium” seems to be an interesting solution from an economic and educational point of view, as well as an alternative for the slowed-down whale centers keeping marine mammals for entertainment, i.e. mainly for the owners' profit.

The analysis of data collected in Wrocław ZOO (where the only educational exhibition about cetaceans in Poland and one of the largest in Europe) confirms the hypothesis that stu-

dents' cognitive curiosity is directed in those directions, at issues with which they identify most strongly (Głoskowska-Soldatow, 2010). A closer topic for them were monkeys, which bear a resemblance to humans, or cetaceans, with which they strongly sympathize because of the image that has been built about them in the currently widely available media. Invertebrates, amphibians and reptiles did not enjoy such interest – only four classes on such topics were held in seven months.

The „Whale Gallery” is also used when guiding organized groups around the Africarium. The recipients of this service are often adults. The most frequently asked questions that zoo educators must answer are: “What kind of fish are these?”, “Where can you find real/live dolphins in Wrocław Zoo?”, “There are no pink dolphins, right?”, “Are there dolphin shows in Wrocław Zoo?”, “Is there a whale here?”. These questions may indicate a further educational path to be followed and the need to raise awareness among adults as well. The fact that so many questions are asked shows great interest in the topic, and the fact that tourists lack such basic knowledge as assigning cetaceans to the appropriate group of animals argues the need to further spread knowledge about cetaceans.

Such great interest in lessons about dolphins may be due to several issues. Firstly, these are new classes in the educational offer. The latest topics attract the attention of teachers who express their willingness to participate in lessons. Secondly – a catchy title. The existence of a pink animal seems unlikely, which stimulates curiosity and the desire to learn more about the topic. Thirdly, the specificity of the issue. Dolphins are perceived by many people as attractive, joyful and sociable. Cetaceans are known from books and films, where they are presented as friendly animals. Therefore, a lesson about them may be more interesting for children who sympathize with them. This is confirmed by the number of individual age groups that were present at the workshops „Do pink dolphins exist?”. The vast majority of them were the youngest, namely students from grades 1–3 of primary school.

Analysis of data from the latest online survey (January–February 2024) provides interesting information. Compared to research conducted 25 years ago, more than 8% of respondents are familiar with the species of harbor porpoise, with this small cetacean still being mistakenly classified as dolphins, and the percentage of visits to the dolphinarium by surveyed respondents has increased more than tripled, while the acceptance of its operation has decreased significantly with almost 81% of respondents (1998) to 37.1% (2024) and conducting dolphin therapy from 100% to 29.7%, with still over 33% supporting this form of therapy in dolphinariums.

Without a doubt, the increase in the popularity of tourism and the introduction of „exotic” trips to the sales offer, including the recently very popular „swimming with dolphins”, resulted in increased visits to dolphinariums by Poles. However, only a slight increase in knowledge about cetaceans in Poland can be observed. However, the opinion about the „Whale Gallery” initiative should be very positive, as for over 87% of respondents it is an attractive educational solution on the topic.

#### SUMMARY AND PERSPECTIVES FOR FURTHER RESEARCH DEVELOPMENT

Despite the passage of over a quarter of a century, Polish society still has little knowledge about cetaceans, but shows constant and significant interest in them. There is a social demand for education in Poland about marine mammals, and therefore the need to develop projects such as „Whale Gallery” with a wide educational offer, especially for children and youth, which received strong support for its operation in the study, especially among biology teachers in Polish schools – primary and secondary school, students who selected and ordered the available topic „Do pink dolphins exist?” most often among other available educational topics. Over the years, the attitude of the surveyed Poles towards dolphinariums and dolphin therapy itself has changed radically. Nowadays, attention is increasingly paid to the wel-

fare of animals in captivity. Currently, despite significant breeding knowledge, technical possibilities, and several attempts, no dolphinarium will be built in Poland, due to a negative opinion of the State Council for Nature Conservation, as well as a skeptical approach of the citizens themselves, who associate dolphinariums with animal suffering. In turn, an alternative may be a rehabilitation center for the endangered Baltic population of the common porpoise and the expansion of scientific and popular cetological exhibitions in Poland in the near future. In line with this, Zoo Poznań is preparing a new open-air exhibition presenting the original skeleton of a whale (*Balaenoptera acutorostrata*), aimed at educating visitors and enriching the cetological knowledge base. Additionally, a publicly accessible exhibition on whales is currently available at the Old Zoo at the Zoo History Museum, further supporting public engagement and education on these marine mammals.

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