

In Search of the Giant of the Pampas: Gathering Conservation Efforts in Argentina, Brazil and Uruguay

By Camila Deutsch^{1,9}, Luis Fernando Marin da Fonte^{2,3}, Raúl Maneyro⁴, Andreas Kindel^{5,6}, Natália Dallagnol Vargas⁷, Marcelo Duarte Freire⁷ & Gabriela Agostini^{1,8}

The Ornate Horned Frog (*Ceratophrys ornata*) is a threatened amphibian species that occurs in the South American temperate grasslands (Figs. 1-4). The historical distribution included the Pampean Region of Argentina, San José and Rocha Departments in Uruguay, and Rio Grande do Sul State in Brazil (1). However, this large range could actually be smaller considering that local populations from Argentina have apparently declined and the species has not been recorded in Uruguay and Brazil for the last 35 years. Until 2016, published occurrence data in Argentina based on field surveys undertaken over the last 30 years were scarce, representing only a few localities in the Pampean Region (2,3,4). On the other hand, the most important herpetological collections of Argentina hold an important number of specimens collected between 1898 and 1980 from areas where the species is currently rare. In Uruguay, *C. ornata* was collected for the last time in Valizas (in 1982) and the species also occurred in two additional localities: Barra de Santa Lucía (specimens collected in 1970) and La Coronilla (specimens collected in 1972) (5). In Brazil records are also scarce, obtained at the southern end of the Brazilian coast in Santa Vitória do Palmar (in 1974, 1976 and 1977) and Rio Grande (in 1979 and 1980) (6,7).

Our knowledge of the biology and natural history of *C. ornata* is deficient and mostly based on observations. It is a voracious flesh eater, feeding on arthropods and small vertebrates (including amphibians) (8) and there are some reports of cannibalism. During the dry season it remains underground, encased in a keratinous cocoon. After staying in this latent condition for a long time, it suddenly becomes active after storms or floods (9). This period of activity is short and hard to predict, making the species difficult to sample and monitor in the field.

CONSERVATION STATUS AND THREATS

Its global conservation status is Near Threatened (10), while it is considered as Vulnerable in Argentina (11) and Uruguay (5), Near Threatened (approaching Endangered) in Brazil (12) and Critically Endangered in Rio Grande do Sul State (13).

The major threats to the species seem to be habitat loss from agriculture and housing developments. Water and soil pollution from agriculture, industry, and human settlements have also been suggested as factors causing population declines (10). In this regard, it is important to highlight that *C. ornata* occurs in the Campos and Pampas of South America which represent one of the most productive agricultural areas of the world (14). Native grasslands

throughout this ecoregion were gradually turned into agro-ecosystems over the past two centuries, leaving almost no pristine grassland areas (15). The introduction of GMO glyphosate-resistant crops and the use of no-till technologies have promoted an unprecedented growth of the agricultural frontier (16). The last remaining patches of semi-natural habitats are small and isolated, frequently

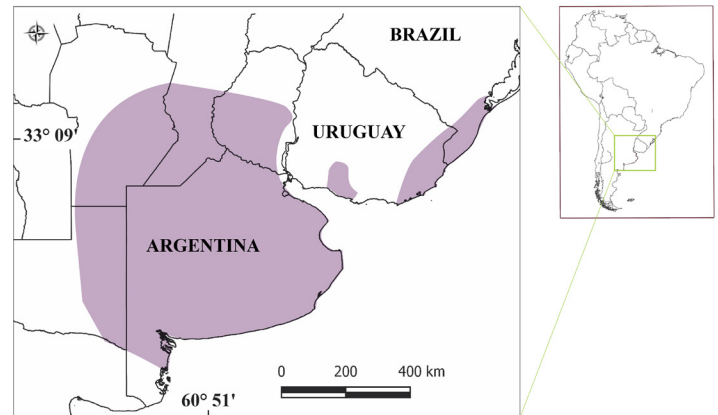


Fig. 1: Map of the estimated range of *Ceratophrys ornata*.



Fig. 2: *Ceratophrys ornata* in Argentina. Photo: Gabriela Agostini.



Fig. 3: *Ceratophrys ornata* in Argentina. Photo: Gabriela Agostini.

¹Conservación de Anfibios en Agroecosistemas, La Plata (1900), Argentina. ²IUCN SSC Amphibian Specialist Group (ASG Brasil). ³Universität Trier, Germany. ⁴Laboratorio de Sistemática e Historia Natural de Vertebrados, Instituto de Ecología y Ciencias Ambientales, Facultad de Ciencias - Universidad de la República Iguá 4225 -Montevideo - Uruguay. ⁵Universidade Federal do Rio Grande do Sul (UFRGS) - Departamento de Ecologia, Porto Alegre, Rio Grande do Sul, Brazil. ⁶ONG Instituto Curicaca, Porto Alegre, Rio Grande do Sul, Brazil. ⁷Universidade Federal do Rio Grande do Sul (UFRGS) - Laboratório de Herpetologia, Porto Alegre, Rio Grande do Sul, Brazil. ⁸GEBA. Grupo de Estudios sobre Biodiversidad en Agroecosistemas. IEGEBA-UBA-CONICET. ⁹E-mail: deucamila@gmail.com



Fig. 4: *Ceratophrys ornata* in Argentina. Photo: Pablo Saibene.

in unproductive or marginal locations, like roadsides, train lines or around lakes (17).

C. ornata is often persecuted because of unfounded beliefs that it is a venomous species. In Argentina, a survey to understand local perceptions of the species was carried out in rural communities and indicated that 80% of encounters end with the death of the frog (18). In the Pampean region of Argentina, it is also collected for the domestic pet market and for scientific purposes at the national level. There is no knowledge of the species being exported, not even illegally, neither for Argentina nor for Uruguay (18, 19).

Given the threats mentioned above, the current lack of records and the replacement of virtually all suitable habitat by agricultural and urban landscapes, the scientific and conservation communities have warned of the imperative to initiate conservation actions.

THE ORIGIN OF OUR WORK

For several years, scientists from Buenos Aires University and the CoAnA Initiative (Amphibian Conservation in Agro-ecosystems) have been studying amphibians from the Argentinean Pampas grasslands and investigating some proposed factors for the global amphibian decline (habitat loss, pesticide impacts, chytrid fungus diseases and abnormalities) (3, 20). That extensive fieldwork generated novel data for *C. ornata* based on studies conducted in natural populations (21). Most of the data were obtained working together with farmers living in rural areas where *C. ornata* occurs (Figs. 5, 6). In 2015 CoAnA established the conservation initiative “The Giant of the Pampas,” where a first objective was to gather occurrence data in order to better define areas where the species still occurs, and then develop conservation and management actions in Argentina. Given the challenges in expanding the knowledge of the species’ distribution and considering that *C. ornata* is an iconic and unique species, the potential benefits of employing a citizen science approach in rural communities as a complement to traditional field surveys were assessed.

THE CITIZEN SCIENCE PROGRAM IN ARGENTINA

In a conservation strategy framework, the CoAnA team set up a citizen science program (CSP) to obtain occurrence data as a complement to field research using online surveys and direct interviews (21). Additionally, the CSP included an exhaustive outreach campaign intended primarily to encourage people to collect and report occurrence data. Because this program was developed within a comprehensive conservation strategy framework, the outreach campaign was also designed to promote and raise awareness of *C. ornata*, the threats it is facing, and other conservation issues. This program successfully increased by nine times the number of records obtained during ten years of field surveys. It was also possible to define the potential distribution and determine two priority conservation areas for this species in Argentina (Atlantic Coast of Buenos Aires and northwestern Pampean Region) (21). This extensive work allowed us to maintain contact with farmers who are still reporting occurrence data for the species, playing an important role for future monitoring studies needed to set up conservation actions and their outcomes.



Fig. 5: Field work: DNA sampling. Photo: Gabriela Agostini.

EXPANDING THE BORDERS: THE INTERNATIONAL STRATEGY

The experience in Argentina indicated that well-designed citizen science methods can provide a cost-effective approach to collect occurrence data for *C. ornata*, in addition to conventional field surveys. Based on this successful experience, we are creating an international strategy aiming to expand activities into Brazil and Uruguay, encompassing the species' global distribution. Although the Giant of the Pampas has not been found in these countries for over 35 years now, specialists agree that the absence of recent records might be linked to its burrowing habits and the lack of targeted searches in the field.

In Brazil, we intend to replicate the CSP combined with targeted field sampling in localities with confirmed and potential records. We aim to: (i) rediscover the species in Brazil and Uruguay, adding new localities, mapping and improving the description of its Area of Occupancy (AOO) and Extent of Occurrence (EOO), as defined in (22); (ii) identify and describe the main threats to the species; (iii) create and establish a protocol in Portuguese to apply CSP as a useful tool for the study of rare and threatened species; (iv) contribute towards other conservation actions currently underway, like the creation of a new protected area close to the Brazil-Uruguay border near the coast, and the identification of other priority areas for the conservation of the Pampa biome in Brazil; and (v) develop a National Action Plan for the species' conservation.

This is the first international conservation initiative for an anuran species developed by South American institutions and it involves extensive efforts, working together with NGOs, Universities and Government Agencies. With this multinational cooperation, we hope to better understand the global geographic distribution of the species, its natural history and the major threats affecting populations. Combining the results obtained in the three countries, we intend to create a global strategy to guarantee the frog's conservation and to promote the Giant of the Pampas as a flagship species for the conservation of the South American grasslands.

HOW CAN YOU HELP?

Have you ever seen the Giant of the Pampas? If you were so lucky, please complete this brief survey and do not forget to add pictures or any additional information to validate your recording.

- Spanish: <https://goo.gl/forms/EkJB9rzoE5iz9NIS2>
- Portuguese: <https://goo.gl/forms/3xr0qPH7Vt06f8PY2>
- Or contact us: gigantedelaspampas@gmail.com



Fig. 6: Working in rural communities. Photo: Gabriela Agostini.

MYTHS AND LEGENDS

It is NOT a poisonous species. NO skin substance has been found that could cause injury or death from poisoning on humans or domestic animals.

The Ornate Horned Frog DOES NOT attack. Sometimes these animals can be aggressive if they feel threatened. If an individual is disturbed or removed from its cave, it can open its mouth and inflate the body. This is just a defense signal.

Its bite DOES NOT inoculate venom. These animals have no teeth or poisonous glands. Under stress, they open their big mouths and emit a characteristic sound that represents just another defensive behavior.

In case we were not clear...this amazing creature IS NOT dangerous.

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