



Amphibian Husbandry Training Courses



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Our Training Mission

Amphibians brought into captivity must have a purpose and must receive the highest standards of care. Our mission for Amphibian Ark husbandry training programs is to provide range-country personnel with the tools and expertise to offer the best care to amphibians under their stewardship and to enable the planning and implementation of successful captive conservation programs that, where appropriate, end with amphibians back in nature.

Our Training Staff

The Amphibian Ark instructor team consists of experienced professionals from the zoo, academic and private communities. All instructors make their services available at no cost to Amphibian Ark or course participants. We are grateful for their valuable contributions to helping further amphibian conservation through their roles as instructors and mentors.

Ron Gagliardo, Training Officer, Amphibian Ark***Amphibian Ark Associate Veterinarians***

*Brad Wilson, DVM
The Veterinary Clinic West*

*Allan Pessier, DVM
San Diego Zoo, USA*

*Sam Rivera, DVM
Zoo Atlanta, USA*

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Amphibian Ark Husbandry Instructors

*Andy Odum
Toledo Zoo, USA*

*Michael Ready
San Diego, USA*

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*Diego Almeida
Centro Jambatu, Ecuador*

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Woodland Park Zoo, USA*

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Robert Hill
Zoo Atlanta, USA*

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Amphibian Ark*

Our Training Courses

What are the goals of our courses?

To create, expand and nurture local, long lasting and useful *ex situ* conservation action within the country or range of focal amphibian species.

Objectives

- 1) To provide technical skills necessary for long-term management of *ex situ* populations of amphibians, from species selection to reintroductions with focus on husbandry, health, biosecurity and population management.
- 2) To build networking capacity for practitioners in range countries/area/regions to better work together in taking charge of the conservation of their local species
- 3) To stimulate interest in amphibian conservation in the region
- 4) To provide guidance on developing regional conservation plans and strategies for building bridges with *in situ* collaborators and municipal partners in the region.
- 5) To provide the most useful set of skills and resources to motivate participants to plan future workshops in their region.
- 6) To assist participants in finding resources for designing, funding and implementing conservation programs in their region.

Our courses are assembled on a case-by-case basis, designed to provide the necessary skills delivered at the right level for participants. We are guided by pre-workshop surveys and also by close collaboration with local organizers to provide these services and make the course as useful as possible.

We have amphibian experts from many different backgrounds at our disposal who are ready and willing to share their time and expertise. We utilize qualified local and regional instructors working in their native languages as much as possible.

Subjects

1. *The Basics: keeping them alive*
 - *Biology and diversity*
 - *Husbandry overview*
 - *Enclosure Design*
 - *Water Quality*
 - *The importance of light*
 - *Horticulture for enclosures*
 - *Live-food culture*
 - *Shipping and transportation*

2. *Reproduction: getting them to breed*
 - *Reproductive Modes*
 - *Captive Reproduction Techniques*
 - *Assisted Reproduction*

3. *Population Management: controlled breeding*
 - *Genetics and demography*
 - *Record keeping*
 - *Individual Marking and Identification*

4. *Veterinary Aspects: keeping them healthy*
 - *Diseases/Pathology/Necropsy*
 - *Nutrition and Diet*
 - *Infectious diseases*
 - *Clinical Care*
 - *Biosecurity and Quarantine*

5. *Conservation: why we are doing this*
 - *Threats and global action*
 - *Program design/planning*
 - *Review of Model Facilities around the World*

Hands on demonstrations, practical and group exercises include:

Water Quality Assessments

Data loggers

Ultraviolet Light Measurements

Horticultural Techniques

Enclosure construction and plumbing

Filters and Plumbing Features

Veterinary applications: handling, restraint, topical applications, diagnostics, parasite investigation and basic identification

Are you considering an amphibian husbandry workshop? Consider this:

Workshops demand a great deal of time and resources to plan and execute. It is important to clearly identify the goals and objectives prior to planning, fundraising and execution. The following questions will help guide you in planning an amphibian conservation workshop.

Is there a need for amphibian conservation training in the region and why?

Are there species in imminent danger of extinction or otherwise assessed by field experts for *ex situ* actions including breeding, research, supplementation or mass production.

Who are the participants/stakeholders? Are they willing and available to participate?

Will the participants be able to put this training to practical use in the time frame needed to be effective? Do funding and other requisite resources exist to initiate new captive programs after the training?

Is there a central location to hold this workshop?

Are the following facilities available for at least a 5-day time span?

- Lecture Room
- Basic laboratory or other area with access to water and electricity
- Veterinary laboratory space or equipment (microscopes, etc.)
- Live amphibians on site or otherwise available

Are there local or regional representatives to help with accommodations, food, ground transportation and facility use before and after the workshop?

What will be the costs of the workshop? Consider:

Who will provide the physical space for the workshop?

Length of the workshop in days?

Number of students?

What are the costs of transportation local, regional, national, or international travel?

What are the costs of accommodations and food?

Instructors

How many local instructors can we identify and at what cost?

Costs for imported instructors (travel, lodging, food)?

Supplies including glass tanks, plumbing accessories, enclosure parts, pumps, etc.

Have we considered costs for administrative time for grant writing and fundraising?

Training Course Budget Example Worksheet

Costs

Space and facility Rental _____
 (Need to rent?)

Supplies _____

Student Costs

As needed per student:

Travel Cost (airfare): = _____

Lodging (____ days x \$____/Night) = _____

Food (____ days x \$____/Day) = _____

Total per student = _____

Total Per Student x _____number of students _____

Instructor Costs

As needed per instructor:

Travel Cost: = _____

Lodging (____ days x \$____/Night) = _____

Food (____ days x \$____/Day) = _____

Total per instructor = _____

Total Per Instructor x _____# of instructors _____

Grand Total: _____

General Course of Action**Initiation:**

Students receive a registration form (includes specific questions regarding *their* expectations and goals along with current level of activity in regards to amphibians). Financial aid information, when applicable is also attached. Students are offered the opportunity to share their own work during the course and if interested, they are requested to submit an abstract. Links to online tutorials may also be included to registrants via a password.

Preparation:

Two weeks prior to the course, students receive electronic files that include:

- Course Syllabus
- 4 to 5 page summary of the course
- A pre-workshop “quiz” that is returned electronically
- List of participants and contact information
- Selected reading list/bibliography

Arrival:

Upon arrival to course, students receive:

- Name badge
- Summary of the course
- The answers to the quiz
- Library of relevant publications or methodological documents.
- Notepad and pen

Conclusion:

At the conclusion of the course, students receive an evaluation form, a post-course assessment form, and a certificate

Post-course activities:

1. AArk contacts each student in order to assess on his or her progress and address any additional questions or issues.
2. AArk creates a mailing list including all students and instructors to facilitate group communication beyond the workshop.

APPENDICES

Our courses are adaptable, designed to suit different needs choosing from any of the topics listed below.

Amphibian Ark Husbandry Workshop Menu	
Topic/Presentation Title	Time
Amphibian Overview	45 minutes
What are amphibians?	
Why are they important?	
Planning for ex situ conservation programs	45 minutes
Decision-making and prioritization for initiation of ex situ work	
Resource allocation, long-term management and exit strategies	
Larval husbandry	45 minutes
Ecology of amphibian larvae	
Techniques for rearing larvae and metamorphs	
Basic Amphibian Husbandry	90 minutes
Planning	
Physical environment (enclosures, etc) and climate control	
Behavior and welfare	
Lighting	30 minutes
Basic overview of light requirements including ultraviolet lighting	
Types of lighting and uses	
Water Quality	45 minutes
Basic water chemistry for amphibians	
Filtration (mechanical, chemical, biological, etc.)	
Water Testing	
Horticulture	30 minutes
Basics of live plants in enclosures	
Benefits and types of live plants	
Live Food	45 minutes
Value of live foods	
Culturing live food	
Potential problems and other aspects of live food culture	
Reproduction Modes	45 minutes
How amphibians reproduce in nature	

Captive reproduction	45 minutes
Techniques for stimulating reproduction	
Rain Chambers and cycling	
Hormone-induced breeding/endocrinology	
Specialty Taxa Husbandry (each about 15 mins, can be combined)	45-90 minutes
Husbandry of bufonids	
Husbandry of dendrobatids, mantellas	
Husbandry of centrolenids and hylids (phyllomedusines)	
Husbandry of <i>Atelopus</i>	
Husbandry of salamanders	
Husbandry of caecilians	
Husbandry of ranids	
Husbandry of microhylids	
Ex Situ Projects around the world	45 minutes
Overview of several programs around the globe	
Exploration of conservation roles and realities	
Ex situ research	45 minutes
Connections between ex situ programs and research	
Planning for research in ex-situ programs	
Infectious Diseases in amphibians	45 minutes
Chytridiomycosis	
Bacterial and viral infections	
Macroparasites	
Noninfectious Diseases and Conditions	45 minutes
Nutritional Deficiencies	
Husbandry related ailments	
Anatomy and physiology	45 minutes
Relevance of anatomy and physiology to basic husbandry	
Health and Nutrition	45 minutes
Importance and role in captive husbandry	
Nutritional supplementation and recognizing deficiencies	
Biosecurity and Quarantine	45 minutes
Basics of biosecurity and prevention of disease transmission	
Risk assessment	

Records and population management	45 minutes
The importance of record keeping	
Heredity and breeding plans	
Identification and Marking	45 minutes
Why is marking important?	
Marking techniques for amphibians	
Shipping and transportation	20 minutes
Proper packing	
Care in transport	
Basics of Husbandry	2 hours
Drilling glass	
Plumbing	
lids and false bottoms	
drinking, build-a-tank	
prop fabrication	
horticultural techniques	
Water-quality Testing	1 hour
Measuring ultraviolet light	1 hour
Enclosure-building experience	2 hours
Experience in Veterinary techniques	3 hours
Fecal Examination techniques	
Parasite Identification	
Restraint and physical examination	
Anesthesia and euthanasia	
Administering medication	
Sampling for chytridiomycosis	
Necropsy and taking samples	

Sample Syllabus and Schedule

Amphibian Conservation Training Course for the Caribbean	
Zoo Dom, Dominican Republic February 5-10, 2012	
Sunday, February 5	
3:00 to 5:00 PM	Registration in hotel lobby
5:00 on	Dinner on your own
Monday, February 6	
7:30 am to 8:30 am	Breakfast at hotel
8:30 am to 9:00 am	Shuttle from hotel to zoo
9:00 am to 10:00 am	Greetings & Course overview
	Introductions
	Logistics
10:00 am to 11:30 am	Amphibian overview
	What is an amphibian? (includes diversity and the two species approach) Why are amphibians important? The global extinction crisis and response.
11:30 am to 12:00 pm	<i>Planning an ex situ program and the role of AArk</i>
12:00 pm to 1:00 pm	Lunch
1:00 pm to 2:00 pm	Overview of Caribbean amphibians and their conservation needs
2:00 pm to 3:15 pm	Student presentations on current projects and discussion
3:15 pm to 3:30 pm	<i>Break</i>
3:30 pm to 4:15 pm	Ex-situ breeding facilities and their contribution to amphibian conservation to date
4:15 pm to 5:00 pm	Introduce Group Projects
	Wrap up and discussion
5:00 pm to 6:00 pm	Dinner at Zoo with lecture "Conservation of Amphibians in the Dominican Republic"
6:00 pm to 9:30 pm	Frogging on Zoo grounds
9:30 pm to 10:00 pm	Shuttle from zoo to hotel
Tuesday, February 7	
7:30 am to 8:30 am	Breakfast at hotel
8:30 am to 9:00 am	Shuttle from hotel to zoo
9:00 am to 10:15 am	Principles of husbandry
10:15 am to 10:30 am	<i>Break</i>
10:30 am to 11:30 am	Lighting
11:30 am to 12:15 pm	Water quality

12:15 pm to 1:15 pm	<i>Lunch</i>
1:15 pm to 4:00 pm	Lighting and Water Quality Practicals Data Logger Exercise Launch
4:00 pm to 4:15 pm	<i>Break</i>
4:15 pm to 5:00 pm	Wrap up for the day and discussion
5:00 pm to 5:30 pm	<i>Shuttle from zoo to hotel</i>
	Dinner on your own/Group projects
Wednesday, February 8	
7:30 am to 8:30 am	Breakfast at hotel
8:30 am to 9:00 am	Shuttle from hotel to zoo
9:00 am to 10:00 am	Amphibian Diet and Nutrition
10:15 am to 10:30 am	<i>Break</i>
10:30 am to 11:15 am	Live food Culture
11:15 am to 12:15 pm	Captive Reproduction
12:15 pm to 1:15 pm	<i>Lunch</i>
1:15 pm to 2:00 pm	Larval Care and biology
2:00 pm to 4:00 pm	Enclosure demonstrations in stations
	Tank drilling
	False Bottoms and lids
	Dressing / Prop making
	Plumbing Features
4:00 pm to 5:30 pm	<i>Break and Group Project time</i>
5:30 to 6:00 pm	Shuttle from zoo to hotel
	Dinner on your own
Thursday, February 9	
7:30 am to 8:30 am	Breakfast at hotel
8:30 am to 9:00 am	Shuttle from hotel to zoo
9:00 am to 9:15 am	Quick review of group project progress
9:15 am to 10:15 am	Records and population management
10:15 am to 11:15 am	<i>Break and Population Management Exercise</i>
11:15 am to 11:30 pm	Review of Population Management Exercise
11:30 pm to 12:30 pm	<i>Lunch</i>
12:30 pm to 3:30 pm	Enclosure Building
3:30 pm to 5:00 pm	<i>Break and Group Project time</i>
5:00 pm to 6:00 pm	Free time in the zoo
6:00 pm to 6:30 pm	Shuttle from zoo to hotel
	Dinner on your own
Friday, February 10	
7:30 am to 8:30 am	Breakfast at hotel
8:30 am to 9:00 am	Shuttle from hotel to zoo
9:00 am to 10:30 am	Amphibian Diseases

10:30 am to 10:45 am	<i>Break</i>
10:45 am to 11:30 am	Biosecurity and Quarantine
11:30 am to 12:30 pm	<i>Lunch</i>
12:30 pm to 2:00 pm	Anatomy, Necropsy and Veterinary Practicals
2:00 pm to 3:00 pm	<i>Break and Group Project time</i>
3:00 to 5:00 pm	Small group project presentations
5:00 pm to 6:00 pm	Summary, next steps, evaluations, certificates
6:00 pm to 6:30 pm	Shuttle from zoo to hotel
	Dinner on your own

Registration Form
Amphibian Husbandry Training

Dates

REGISTRATION DEADLINE MONTH-DAY-YEAR

1. Personal Details

Full Name: Dr / Mr / Mrs / Ms / Miss	
Name as it should appear on your name badge:	
Company / Organization	
Designation:	
Mailing Address:	
Telephone:	Fax:
Email:	

2. REASONS FOR ATTENDING THIS COURSE:

3. I am currently involved in amphibian conservation work and would like to make a short presentation about my project at this workshop. Yes No

PLEASE FILL OUT ATTACHED "PRESENTATION SUMMARY FORM"

4. Language Preference/Fluency

Please indicate:

Spanish English French

other _____

5. Lodging**CHANGE AS NEEDED****6. Travel**

Please indicate:

- I do not need travel funds toward airfare or lodging.*
- I need help with travel costs and am applying for a **Travel Assistance Scholarship.***

7. Meals**CHANGE AS NEEDED**

The Organizers will provide lunches and coffee breaks during the workshop. There will be vegetarian options available. **Note all meals outside of those provided during the workshop times, is on your own.**

Please indicate if you have any special dietary requirements:

.....

8. Registration fees and payment summary

A US\$25 Course Fee is due upon arrival.

9. YOUR COMMITMENTS:**By submitting this registration form and reserving my space in this course, I am committing to the following:**

- 1) To submit any pre-course materials by the dates requested**
- 2) To be present for all aspects of the course**
- 3) To organize a training course in my home region within one year.**
- 4) To cover all personal costs of lodging, food or travel unless other specific arrangements have been made and confirmed in writing.**

8. Disclaimer

Any person who participates in the Amphibian Ark Amphibian Conservation Training does so entirely at his/her own risk and shall be deemed to have understood the risks associated with the Workshop. The Organizers, their employees and agents will take all necessary precautions to ensure the safety of the participants but shall not be responsible for any death, personal injury or damage sustained or arising out of his/her participation in the Workshop save where such death, personal injury or damage is due to the negligence, act or omission of the Organizers, its employees and/or agents.

In the event of an accident or other emergency occurring to the participant during the Workshop, the Organizers may at its sole discretion provide medical treatment or other types of assistance at its expense. Such exercise of discretion shall not be deemed as an admission of liability by the Organizers for any injury or loss sustained by the participant.

Name/Signature

Date

To be returned to:

[Ron Gagliardo](mailto:ron@amphibianark.org)
Amphibian Ark
Woodland Park Zoo
601 North 59th Street
Seattle WA 91803
ron@amphibianark.org

(Please return the registration form no later than **DATE)**

PRESENTATION SUMMARY**1**

Name:
Organization:
Title of your presentation:
Brief (100 words or less) summary of your presentation
Is your presentation in PowerPoint? Other? LENGTH:
Email:

2. Please submit this form with your registration.

3. You will be contacted soon and asked to send a copy of your presentation to the organizers one week prior to the course start date.

TRAVEL ASSISTANCE SCHOLARHIP APPLICATION

A limited amount of travel assistance funding may be available for this workshop. Fill out the following form and return by **DATE** to apply.

1. PERSONAL DETAILS

Full Name:
Organization
Amount of funding needed in total:
Funds are needed for: Airfare/Transportation _____ VISA/other documents _____ Other (specify) _____
Mailing Address:
Email:

2. Travel funds are reimbursed at the end of the course unless arrangements are made in advance.

3. Reimbursement of travel funds is contingent on full participation in the course.

4. Receipts for all travel costs must be provided for reimbursement.

5. All registration materials must be submitted on time to be able to apply for travel assistance.

6. **Letter of recommendation is required from your supervisor/director or professor.**
I understand that by accepting travel assistance, I am committing to my full attendance and participation in this course.

_____ *Date*

Signature Required

Print Full Name

Pre Course Quiz**Questions**

1. What is the number one threat to amphibians worldwide?
2. Name two characteristics of amphibians that make them particularly vulnerable to external threats?
3. Name three roles for amphibians in captivity
4. Name at least two advances made through studying amphibians in captivity which have been of benefit to humans?
5. What is the name of one species of amphibian which only occurs in captivity, i.e. extinct in the wild?
6. What is the exit strategy for a captive breeding program?
7. For your home country, how many species were recommended for rescue by Amphibian Ark Conservation Needs Assessment Workshop (if applicable)?
8. Why is light important for amphibians?
9. What are the most important considerations for raising amphibian larva?
10. Name 4 different food items eaten by amphibians
11. What are the most important minerals in an amphibians diet?
12. Name as many amphibian diseases as you can.
13. How might you individually identify (mark) amphibians?
14. Why is temperature important in amphibian keeping?
15. Select an amphibian species native to your region and provide:
 - Genus and species
 - Range
 - Description of its habitat and environment
 - Reproductive mode and season
 - Red List Status and AArk recommendations for the species
16. What amphibian species have you worked with in captivity?
17. Which is your favorite amphibian?

Post Course Quiz

1. What is the number one threat to amphibians worldwide?
2. What is the first thing you should do before bringing an amphibian species into captivity?
3. What are three roles for amphibians in captivity?
4. List three examples of enclosure types?
5. What is substrate and why is it important in the amphibian enclosure?
6. What is water quality and why is it so important for amphibians?
7. Explain what happens to nitrogenous waste released from an amphibian?
8. What are two variables to consider when looking at the level of ammonia in the water?
9. Why is light important?
10. Why is UV-B important?
11. Name 2 ways to stimulate amphibians to breed?
12. What happens when you increase the density of tadpoles in a tank?
13. Name two vitamins that are important to amphibian health.
14. What is the minimum genetic diversity we should be trying to maintain within a captive population if its purpose is to ultimately go back to the wild?
15. What is the difference between population size and the effective population size?

Amphibian Ark Husbandry Workshop Evaluation		
Topic	On a scale of 1 to 5 (with 5 being most useful or relevant) please rate this presentation or activity.	Specific comments or suggestions?
Amphibian Conservation Overview		
Planning for ex situ programs		
Larval husbandry		
Basic Amphibian Husbandry		
Lighting		
Water Quality		
Live Food		
Reproduction		
Population Management		
Veterinary Aspects		
Diet and Nutrition		
Biosecurity		
PRACTICALS		
Water Quality Exercise		
Measuring UVB		
Tank drilling		
False Bottom/Rain Chamber		
Preparing backgrounds for tanks		
Building enclosures		
Veterinary Practicals		
Parasite Identification		
GROUP PROJECT		
Did this workshop meet or exceed your expectations?		
General suggestions and comments for improving this course		
THANK YOU FOR YOUR FEEDBACK!		