

**Marsh Education:
A Non-profit Organization Benefitting
Arizona's Children and Native Fishes**

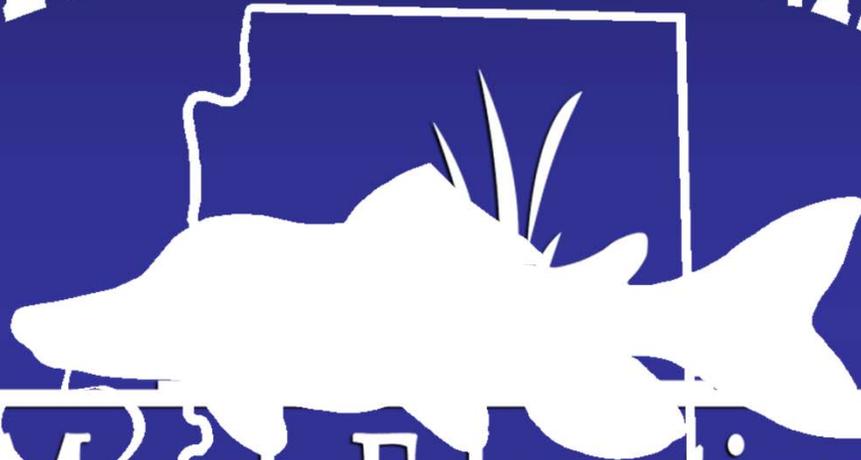
Carol A. Pacey and Paul C. Marsh



Marsh Education

**5016 S. Ash Ave, Suite 108
Tempe, AZ 85282**

Sharing Tails[®]



Marsh Education

Teaching children about native Arizona fish

Marsh & Associates, LLC with USDI BR

Why we created Sharing Tails®

- Most Arizonans are surprised to learn that we have fish unique to our state
- A majority of these fish (78%) is federally listed or candidates for listing as endangered or threatened or they are Wildlife of Special Concern in Arizona
- Millions of dollars spent on our native fish

How we created Sharing Tails®

- Researched what native fish information and programs were available to kindergarteners at local, state and federal levels
- Submitted unsolicited proposal to the BR, Phoenix Area Office that coincided with their desire to convey to the public the value of native aquatic species



Sharing Tails[®] K-2 Program

1. Create Microsoft[®] Access school database
2. Develop staff costume
3. Create materials to meet AZ Science Standards per grade level
4. Develop on-site presentation
5. Develop native fish replicas
6. Perform on-site visits

Sharing Tails® Pre-Visit Materials

- Coloring guide



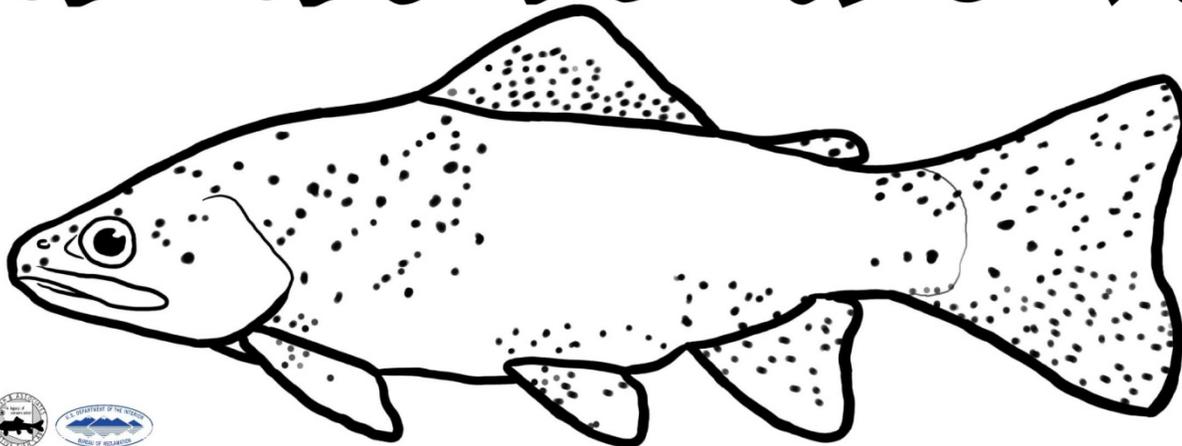
- Location guide to see native fish in Arizona
- List of suggested fish reading for students

Sharing Tails® Pre-Visit Materials

Kindergarten

A native Arizona fish is the...

apache trout



Funding for Sharing Tails® provided by
Bureau of Reclamation, Phoenix Area Office, Glendale, Arizona
Fish Sticks craft sheet and artwork © Marsh & Associates LLC

This is Arizona's state fish!

Sharing Tails® Pre-Visit Materials

Kindergarten

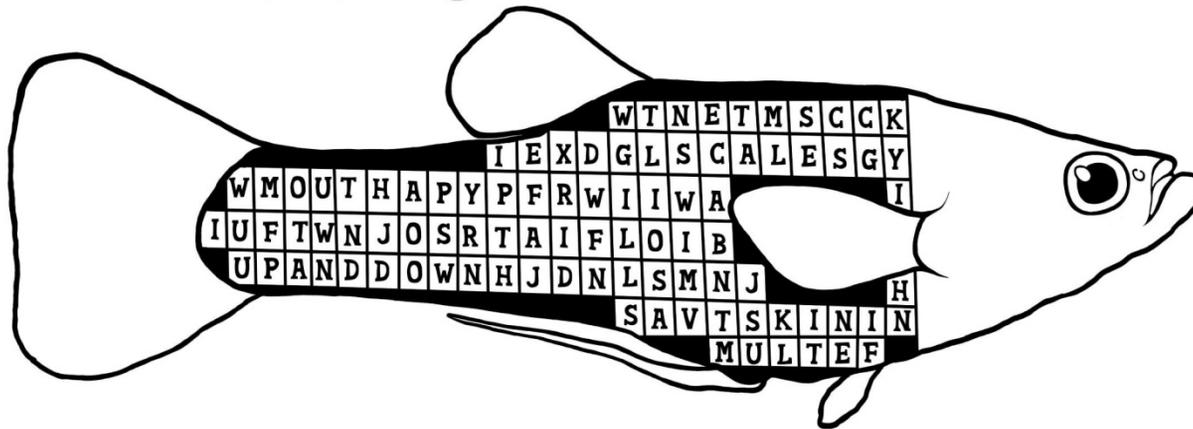


Sharing Tails® Pre-Visit Materials

First Grade

A native Arizona fish is the Gila topminnow.

This fish likes slow moving water!



Circle the best answer then find it in the “fishy” word search!

- | | | | | | | | |
|--------------------------|----------|-----------|--------------|-----------------------------|-------|----------|---------|
| 1. Fish move using their | legs | fins | wings. | 5. Fish breathe using their | lungs | balloons | gills. |
| 2. Fins help fish move | up | down | up and down. | 6. Gills are near a fish's | mouth | tail | food. |
| 3. Fish have | feathers | tree bark | scales. | 7. A backbone helps a fish | fly | swim | run. |
| 4. Scales protect fish | noses | skin | toes. | 8. Backbones are | hard | soft | sticky. |



Funding for Sharing Tails™ provided by
Bureau of Reclamation, Phoenix Area Office, Glendale, Arizona

Sharing Tails®: Teaching children about native Arizona fish
Art and activity © by Marsh & Associates LLC



Sharing Tails® Pre-Visit Materials

First Grade



Arizona Native Fish Data Book

Name: _____

Observation: The desert pupfish  and loach minnow  are small fish. The desert pupfish and loach minnow are bigger than some first graders' "Number 1" fingers. The Gila topminnow  is also a small fish.

Question: Is a Gila topminnow bigger, smaller or the same as my "Number 1" finger?

Hypothesis: A Gila topminnow is than my "Number 1" finger.

Let's investigate!

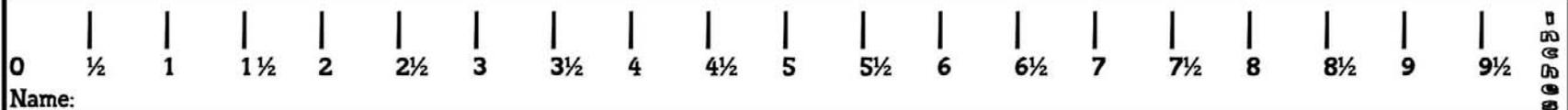
My "Number 1" finger

Gila topminnow

1. My "Number 1" finger is _____ inches.

2. The Gila topminnow is _____ inches.

3. Is my Hypothesis correct?
Yes No



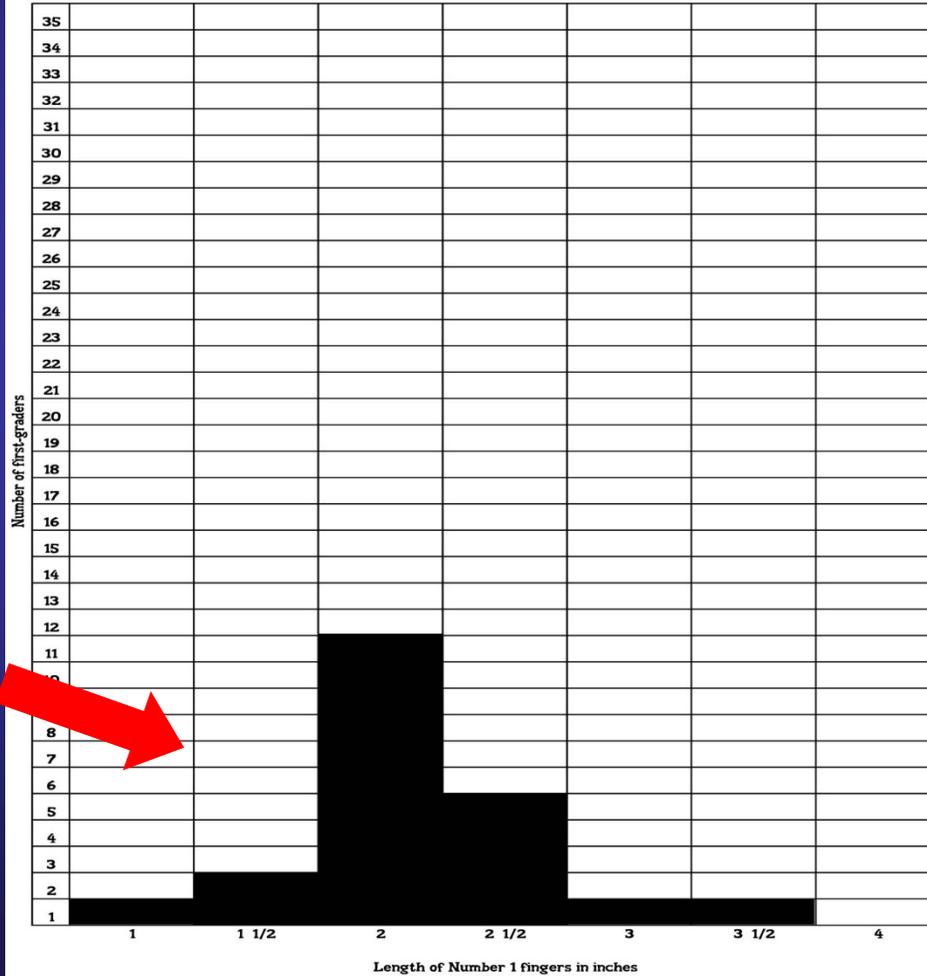
© 2005

Sharing Tails[®]

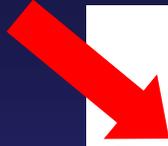
First Grade Teacher Summary Table

Hypothesis results:

"Correct"	6
"Incorrect"	15
Total	21



Notes:

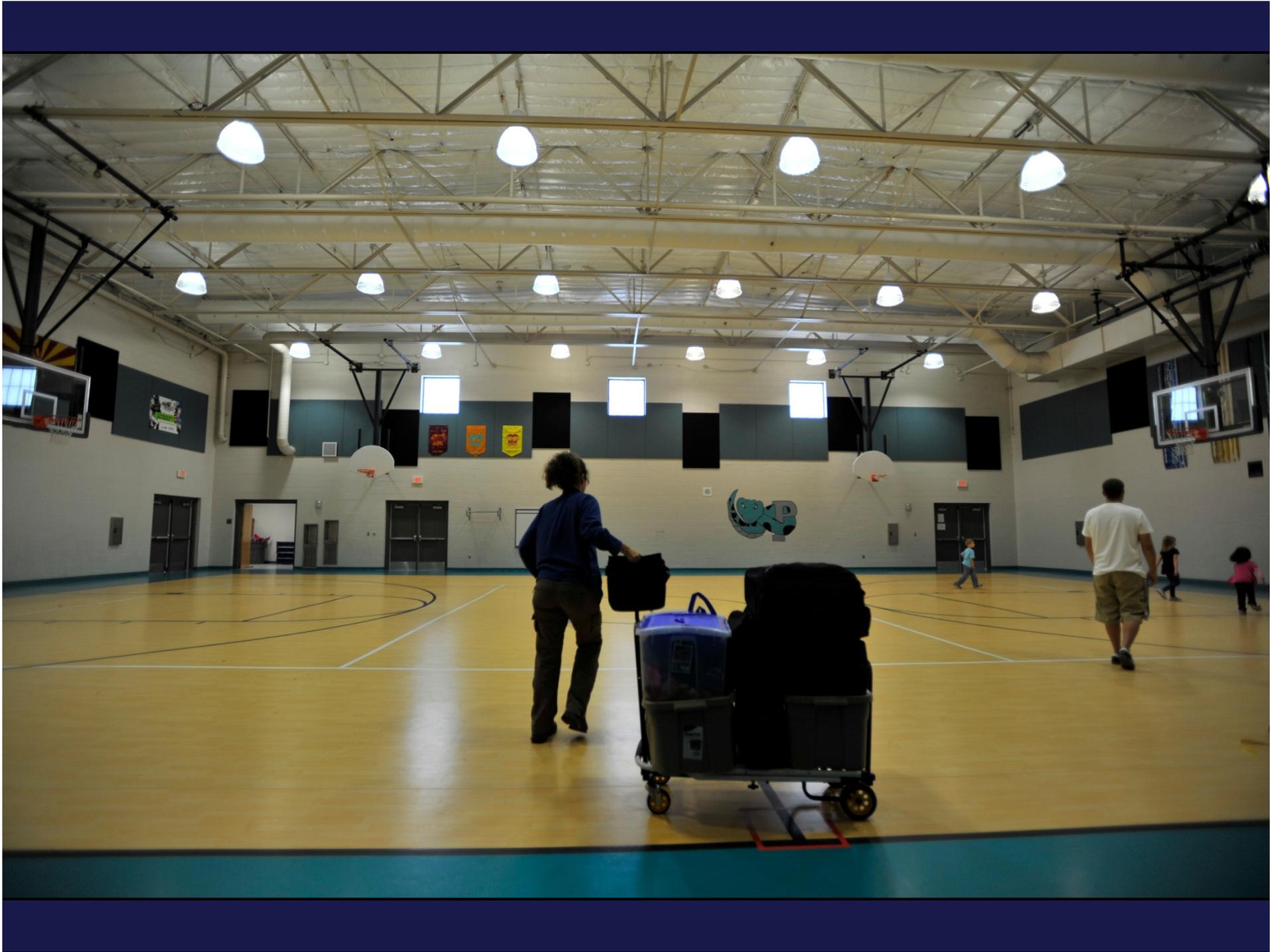


Sharing Tails[®] On-Site Visits



+ 25,000 miles!





Sharing Tails[®] Presentation

1. Photos

2. Art, clip art and animated-clip art

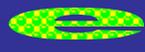
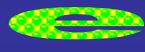
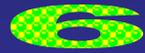
3. Videos

4. Props

5. Hands-on materials

Sharing Tails® Presentation

Kindergarten Hands-on Materials



A hoop net too!

Sharing Tails[®] Presentation

First Grade Hands-on Materials



Sharing Tails[®] Presentation

Second Grade Hands-on Materials

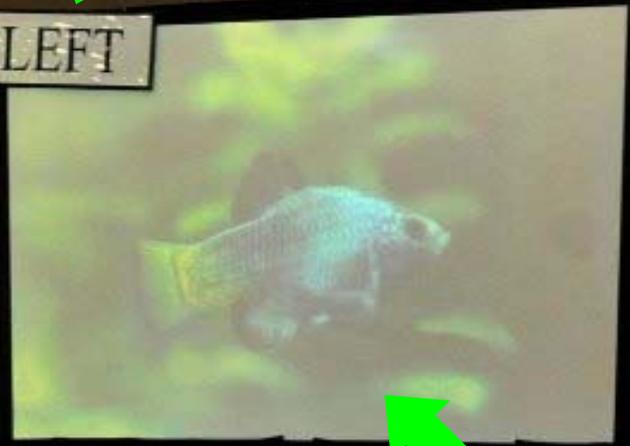


Sharing Tails® Presentation

Kindergarten
Sharing Tails®



LEFT



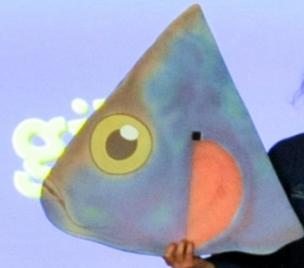
RIGHT





LEFT

RIGHT



oxygen

Desert pupfish and gills!

LEFT

razorback
sucker

Name

RIGHT



Photo



Life-sized model



Sharing Tails® Post-Visit Materials

Native Fish Replicas



Sharing Tails[®] On-Site Visits 2009-2011

Year	% Target <i>N</i> Students (<i>N</i> Students)		
	K	1st	2nd
One	100 (10,000)	-	-
Two	75 (7,500)	25 (2,500)	-
Three	50 (5,000)	25 (2,500)	25 (2,500)

Sharing Tails[®] On-Site Visits 2009-2011

Year	N Students (% Target N Students)		
	K	1st	2nd
One	5,863 (59)	-	-
Two	10,730 (143)	1,539 (61)	-
Three	10,380 (208)	3,925 (157)	848 (34)

Sharing Tails[®] On-Site Visits 2009-2011

Grade	Total N Students (% Target N Students)
K	26,973 (120)
1st	5,464 (109)
2nd	848 (34)
Grand Total	33,285 (111)

Sharing Tails[®]



Marsh Education

Teaching children about native Arizona fish

Marsh & Associates, LLC with USDI BR



Marsh Education

Marsh Education formed in 2013, a not-for-profit 501(c)(3) branch of Marsh & Associates LLC

Vision – Arizonans appreciate, respect and protect native Arizona fishes

Mission – To educate Arizona's children about native Arizona fishes

It's that simple



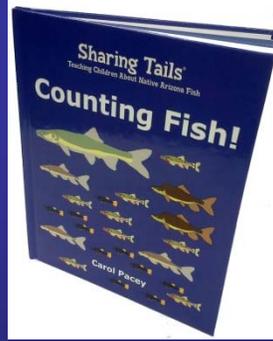
Marsh Education

Goal – To provide the “Sharing Tails[®]” program free to Arizona public elementary schools

Objective – To develop funding sources for Marsh Education to support the “Sharing Tails[®]” program

Fundraising efforts...

500+ kids at six schools
for first half of
this school year!!!



Sharing Tails®

Are we making an impact?

I will help protect them!

I will help protect them!



ASHhex

Marsh Education

Are we making an impact?

Acknowledgements



Bureau of Reclamation,
Phoenix Area Office, Glendale, AZ



Native Fish Lab
Marsh & Associates, Tempe, AZ



Randall D. Babb & Dave Ward
Arizona Game and Fish Department



Bureau of Reclamation,
Boulder City, NV



Marsh Education

www.marsheducation.org