



Transporting Small Quantities of Fish

2005 Aquaculture Forum

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What Are You Hauling?

- **Trout**
 - **Bass**
 - **Bluegill**
 - **Catfish**
 - **Ornamentals**
 - **Bait Fish**
- **Size**
 - **Quantity**

Loading Densities

<u>Specie</u>	<u>Length</u> (in)	<u>lbs/gal</u>	<u>Fish/lbs</u>	<u>Fish/gal</u>	<u>Temp</u> (°F)
Trout	2	1	312	312	50
	4	2	38	76	
	8	2.5	5	13	
Catfish	2	1.75	500	875	60
	4	3	50	150	
	9	5	4	20	
Bass	2	.50	400	200	60
	3	.66	100	67	
	4	1	25	25	

Transport Containers

- **Buckets**
- **Trash Cans**
- **Rubber Totes**
- **Cattle Troughs**
- **Plastic Bags**
- **Displacement**
 - **Density of water equal to fish**
 - **1 gallon per 8.4lbs**



Water

- **Sources**
 - **Springs**
 - **Wells**
 - **Production System**
 - **Inlet**
- **Clean and Clear**
- **Salt**
 - **Feed or table salt (no iodine)**
 - **.8% 4.75 tsp/gal**



Temperature

- **Temperature**
 - **Temperature relative to production**
 - **Lower temperatures increases solubility of oxygen in water and decreases metabolic activity**
- **Ice**
 - **.5lbs/gal lower temp 10°F**
 - **Avoid using ice made from chlorinated water**
 - **Chlorinated can be left in bag**

Dissolved Oxygen

- **Dissolved Oxygen**
 - **Minimum of 5mg/l**
 - **Oxygen consumption increases as fish size decreases**
 - **Oxygen consumption highest directly after loading**
 - **Aerators, agitators, oxygen tablets, bottled oxygen**

Harvesting

- **Off Feed**
 - 1-3 days
 - Losses increase when fish are full
- **Healthy**
 - Reduce losses due to stress
 - Contamination of other fishes
- **Minimize Stress**
 - Load quickly while avoiding injury
 - Heat, bright sunlight, wind

Transport

- **Time**
 - **Begin trip immediately after loading**
 - **Avoid stops and erratic driving**
- **Temperature**
 - **Monitor temperature on long trips or during warm weather**
 - **Use ice to cool water**

Transport

- **Dissolved Oxygen**
 - **Signs of oxygen depletion**
 - **Swimming at top of water**
 - **Piping**
 - **Lethargic**
 - **Color change**
 - **Increase oxygen level**
 - **Cool water**
 - **Pouring**

Unloading

- **Tempering**
 - **Water quality**
 - **Temperature**
- **Mix receiving water with hauling water**
- **Temper fish at least 20 min. for each 10°F difference in water temperature**
 - **More time the better**

Fish Losses

- **Poor Water Quality**
 - **Dissolved oxygen**
 - **Temperature**
- **Overcrowding**
 - **Too many fish at a time**
- **Tempering**

Example

- **Trout**
 - **John Troutman**
 - **Moorefield, WV**
 - **Stock stream with 200, 8 inch rainbows**
 - **Steve Haines, Flowing Springs Farm**
 - **Rio, WV**
 - **45 minutes**
 - **2.5 lbs/gal (5 fish/lbs) 13 fish/gal**
 - **15 gallons of water displace 5 gallons**
 - **25 gallon tote with lid**
 - **Oxygen bottle, regulator, and air stone**

Example

- **Catfish**
 - **Shirley Mudcat**
 - **Charles Town, WV**
 - **Stock ½ acre pond with 300, 4inch channel catfish**
 - **Andrew Zetts, Zett's Tri-State Fish Farm and Hatchery**
 - **Inwood, WV**
 - **30 minutes**
 - **3 lbs/gal (50 fish/lbs)** **150 fish/gal**
 - **2 gallons of water** **displace ½ gallons**
 - **5 gallon bucket**
 - **Clip-on Aerator**

Example

- **Bluegill**
 - **Charles Fisher**
 - **Lewisburg, WV**
 - **Supplement 1 acre pond with 250, 2 inch Bluegill and 6, 10 inch Grass Carp**
 - **Fred Hayes, Divergent Natural Interests**
 - **Elkview, WV**
 - **2 hours**
 - **.5 lbs/gal (400 fish/lbs) 200 fish/gal**
 - **1 ¼ gallons of water displace <1/2 gallon**
 - **Plastic bag and fills bag with oxygen**
 - **3 grass carp per bag 2 bags**

Resources

- **Producers**
- **Books**
 - **Fish Hatchery Management, US Fish and Wildlife Service**
 - **Catfish Farming Handbook**
- **West Virginia University Extension Service**
 - **Dr. Ken Semmens**
 - **Dan Miller**
 - **Rodney Kiser**
 - **Local extension agent**
- **WWW.Aquanic.org**