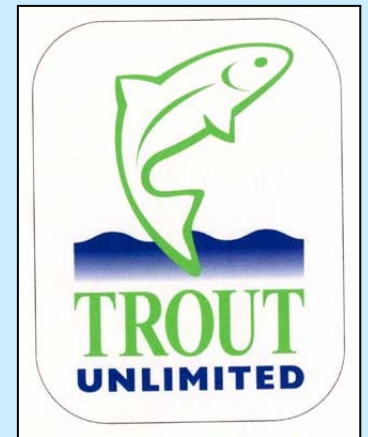




Native Salmonid Restoration using Streamside Incubation



Donald A. Duff
U.S Forest Service
and
Dr. Fred Eales
and Joe McGurrin
Trout Unlimited



TU Grassroots & Resource Protection

TU volunteers support many types of resource protection projects. They leverage their resources using grants such as Bring Back the Natives and TU's own Embrace-A-Stream.



"Old Fridge" hatchbox



Riparian planting

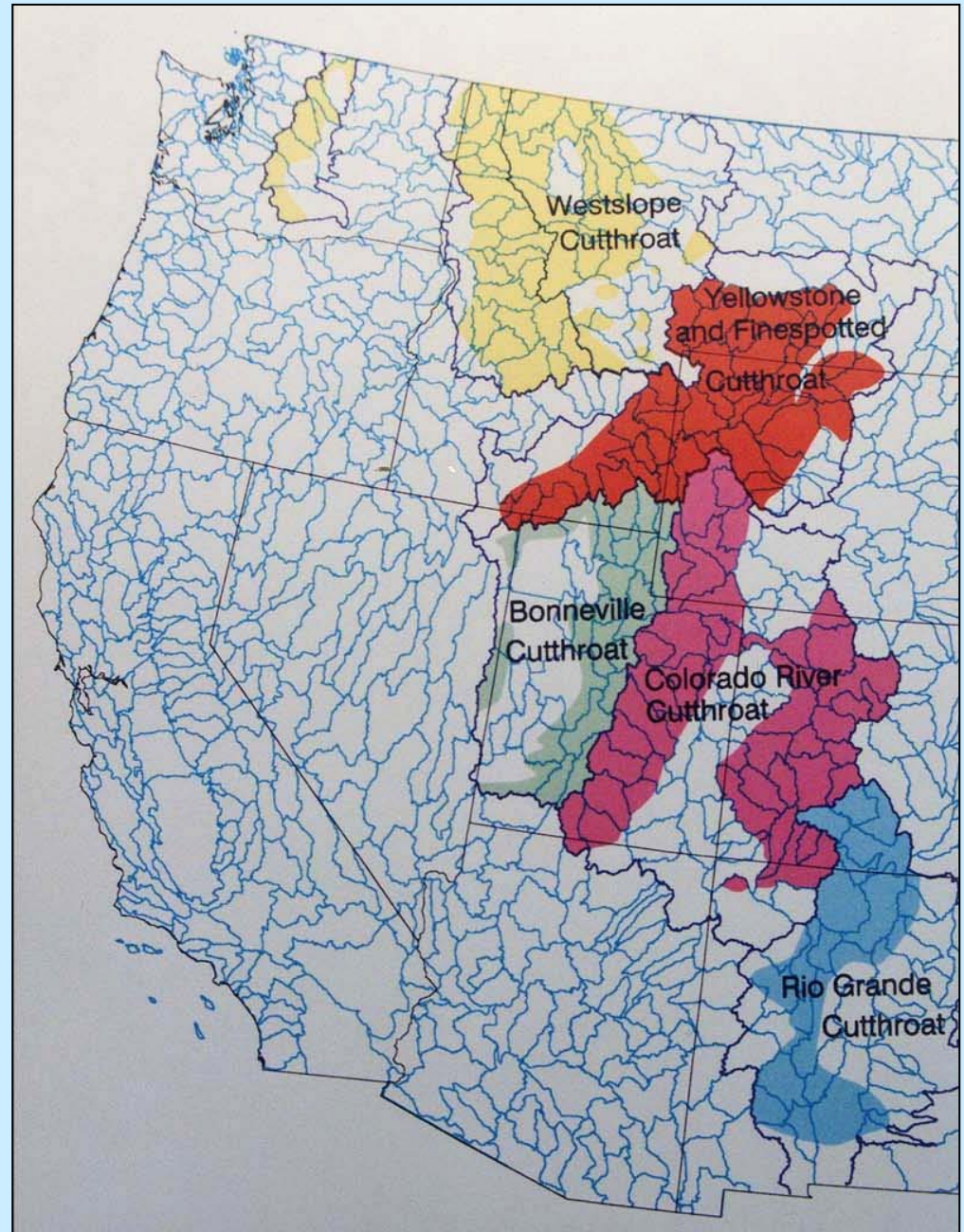


**Colorado Greenback
Cutthroat Trout Restoration**



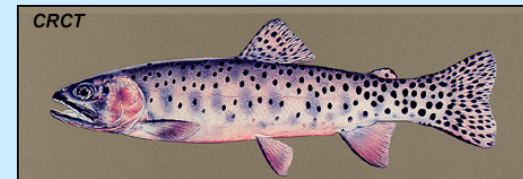
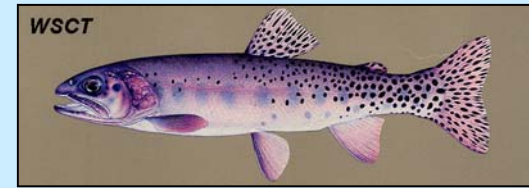
**Water Quality
Monitoring**

Trout Unlimited and U.S. Forest Service work with State and Federal agencies and Native American Tribes to enhance restoration of native salmonids in Western U.S.

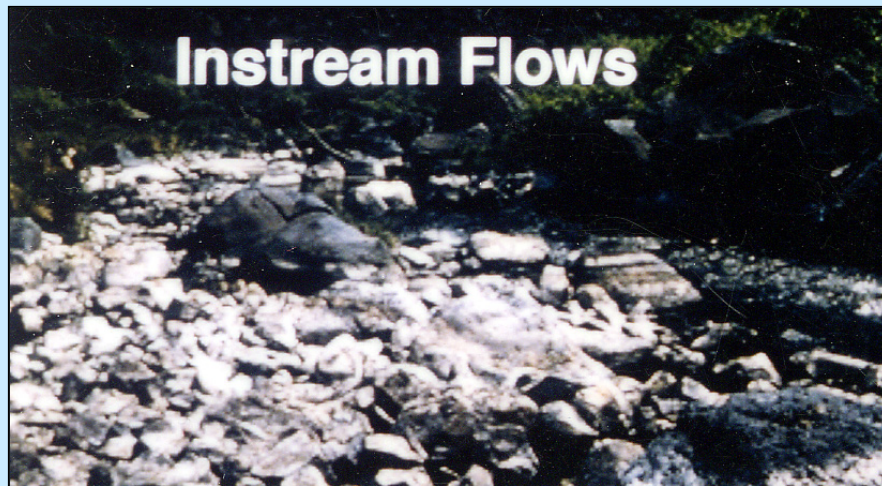
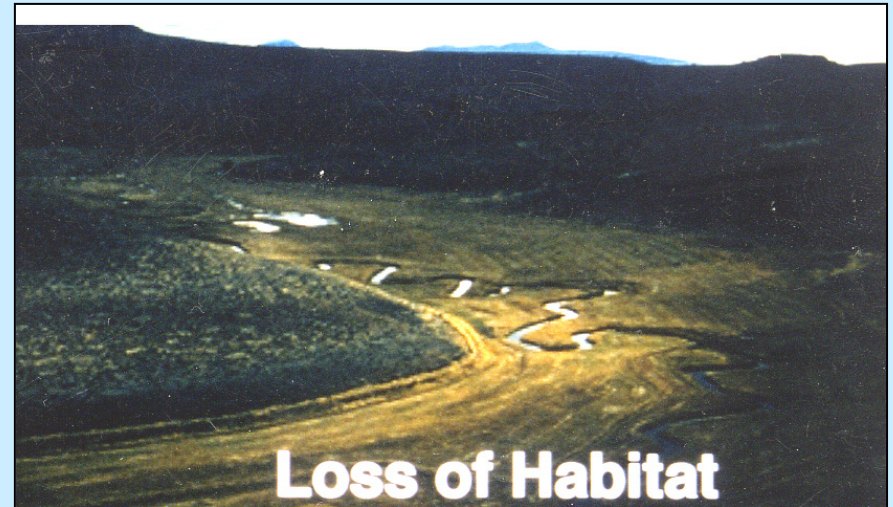


Some Western native cutthroat trout include:

- Westslope
- Lahontan
- Colorado River
- Yellowstone
- Bonneville
- Rio Grande



Land management can affect recovery of native species



Low tech methods assist native salmonid recovery



The old refrigerator

... you never know where you'll find one!

... the 'ole fridge' is now a streamside incubator





A refrigerator can hold upto 80,000 salmonid eggs.

Hatching success is 85 – 99%.

Swim-up fry ready to exit the fridge.



TROUT SPAWNING TRAP AND STREAMSIDE INCUBATOR

Pure-strain Bonneville cutthroat trout are collected at a spawning trap at Spring Creek and 15 Mile Creek. Eggs are collected from the spawning fish, fertilized and placed in special containers called "Whitlock-Vibert Boxes", which are then put inside specially refurbished refrigerators that simulate the dark, cool, oxygenated conditions under the gravel in a natural stream channel.

Eggs will take several weeks to hatch and the small fry then exit into the channel and begin their life as wild trout in the stream. Future generations of fish from this site will be used to replenish this beautiful native cutthroat to a portion of its former range and create new fishing opportunities for anglers.

**Confederated Tribes of the Goshute Reservation
In cooperation with U.S. Fish & Wildlife Service and
Trout Unlimited**

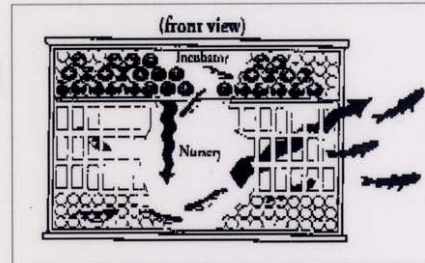


Diagram of Whitlock-Vibert Box

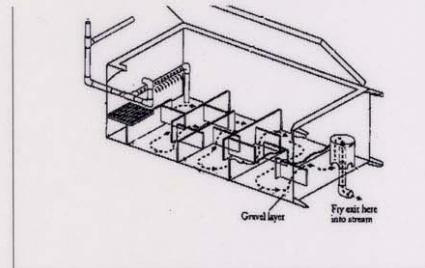
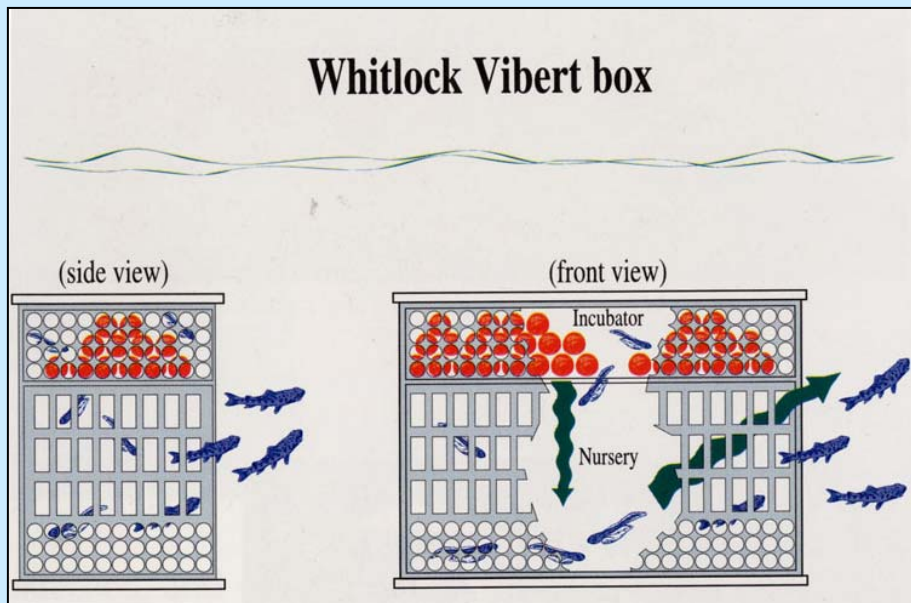
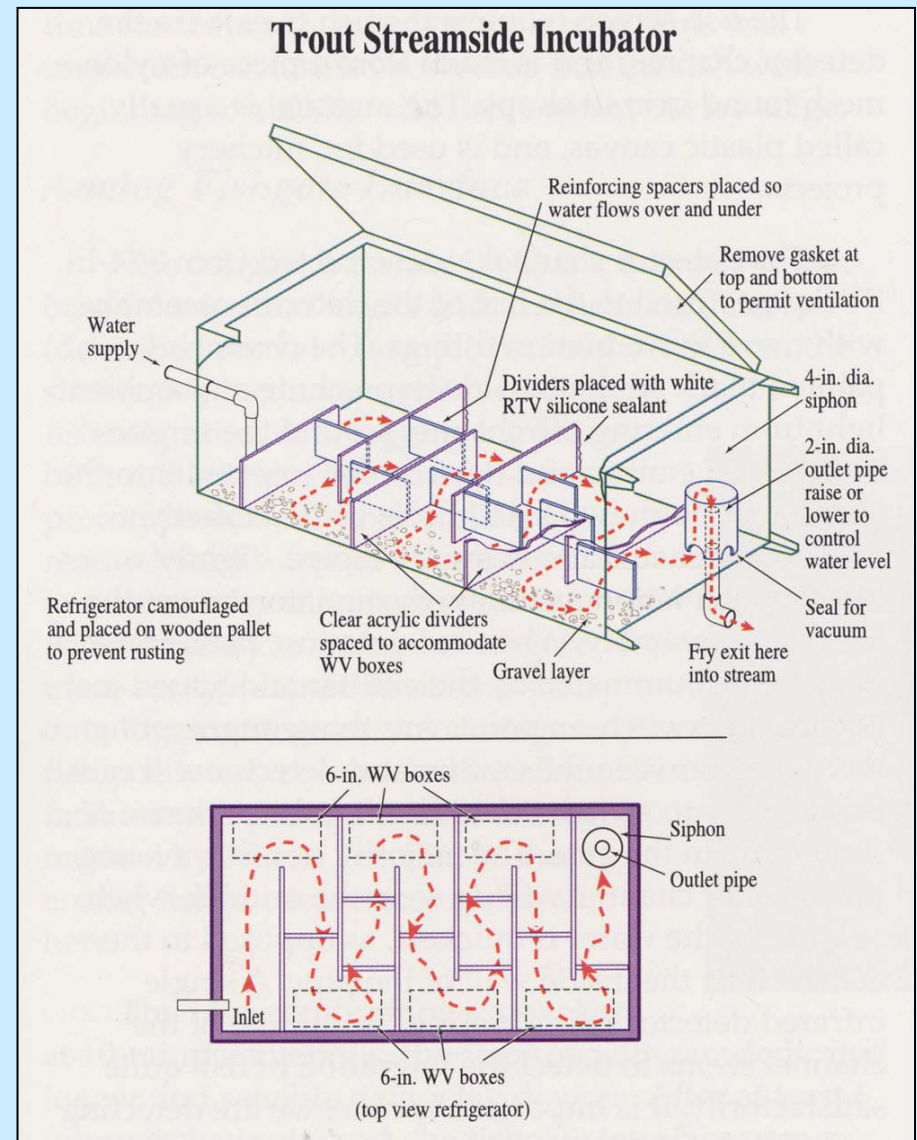


Diagram of interior of refrigerator incubator box





Eggs are placed in top of the Whitlock-Vibert boxes



Schematic of the Fridge Streamside Incubator



Eggs are placed in the top compartment

Boxes with eggs are placed within the fridge's 'channels'



Streamside Incubators can be hooked up to –

... springs and

... streams



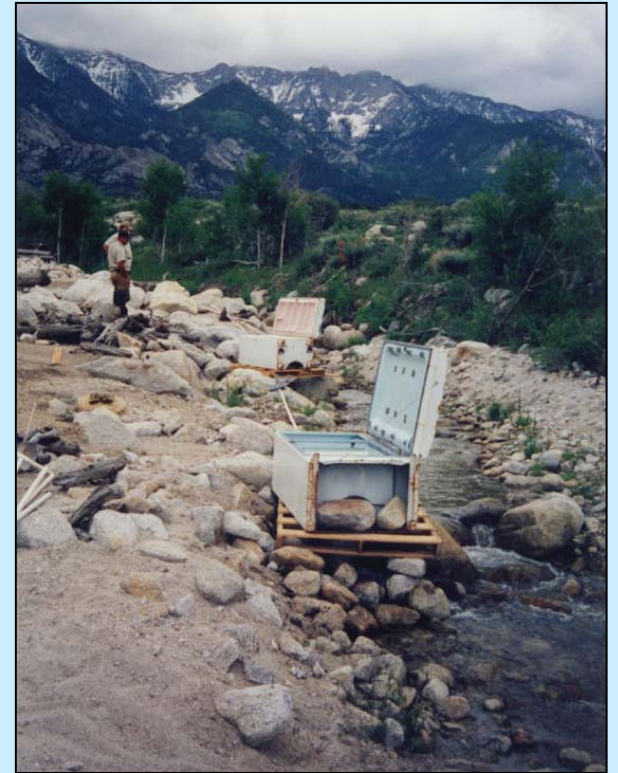
Gravity flow provides water to the incubators





Streamside incubators used to “jump-start” wild trout recruitment into fishless waters rather than using hatchery fish.

5,000 eggs here with 92% hatchery success.



Freezer compartments
in old fridges can serve
as sediment
“catchment basins” to
reduce fine sediment
into the incubator



“Coleman coolers”
can be used as
streamside incubators



The 48-quart size can hold 8,000
eggs



The small “6 pak” lunch-cooler

Coleman coolers can be set up at remote stream locations



Intake PVC pipe



Anchored in streambed



Cooler with 50-feet, 1 inch PVC pipe, gravity flow

Water in



Water and fry exit

Cooler with 8 egg boxes with 8,000 eggs.



**Incubators can be made from
all sizes of “coolers”**



Dr. Fred Eales, Wyoming TU, shows his new design of an “upweller” bottle for hatching eggs.



The new “upweller” bottle design can take up to 5,000 eggs and can be used with Witlock-Vibert boxes

Native Americans use incubators to recover native trout



Goshute Tribe, Utah-Nevada, USA is restoring the native Bonneville cutthroat trout known as their “red-fish” to Tribal waters





The Goshutes, TU, and partners
constructed a brood pond ...

... with spawning channels



BONNEVILLE CUTTHROAT TROUT STREAMSIDE INCUBATOR PROJECT



One of only two native trout species to Utah, it is native to the Bonneville Basin. This project at 15 Mile Creek and its tributaries is a wild onstream broodstock site for this species. Fish at this site are protected and fishing is not allowed .

Fish produced at this facility will be used to return this species to its former range and increase fishing opportunities for this beautiful trout in the future.

This project for species recovery and better fishing is being managed by the Goshute Tribal Council in cooperation with the U.S. Fish & Wildlife Service and Trout Unlimited .



BONNEVILLE CUTTHROAT TROUT SPAWNING AND INCUBATION CHANNEL



Bonneville Cutthroat Trout (*Oncorhynchus clarki utah*)

DO NOT DISTURB THE CHANNEL!

Do Not Walk or Play in this Stream Channel
Spawning Trout Are in the Channel and Small Trout Fry are
in the Gravel of the Stream.

Protect Your Trout's Home!
Thanks for Your Cooperation

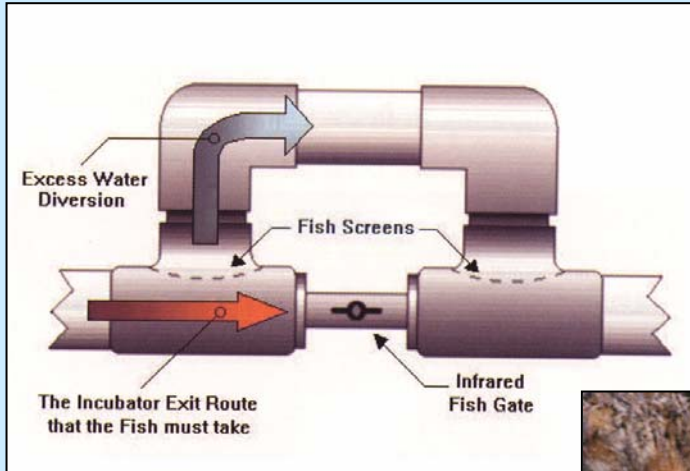
Confederated Tribes of the Goshute Reservation



In cooperation with
Utah Division of Wildlife Resources
U. S. Forest Service
Trout Unlimited
U.S. Fish & Wildlife Service



The Goshute Tribe, TU, and Deep Creek Mountain Ranch are testing with NASA and U.S Navy ...



A Fish Detector with an infrared beam ...

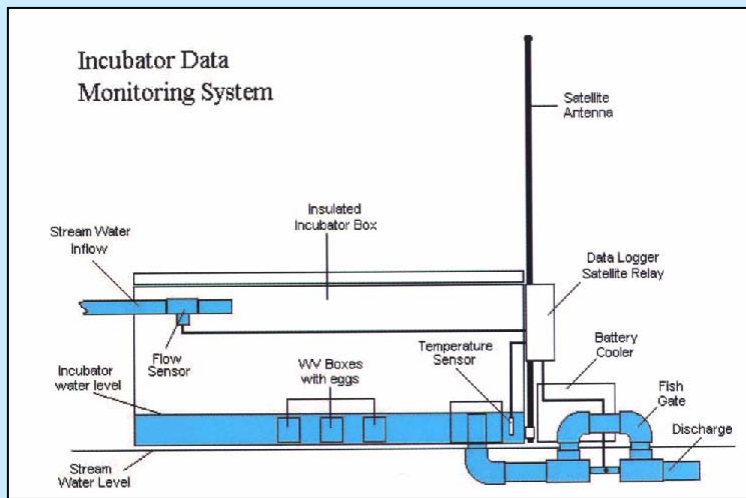
... hooked upto outlet of the "old fridge"



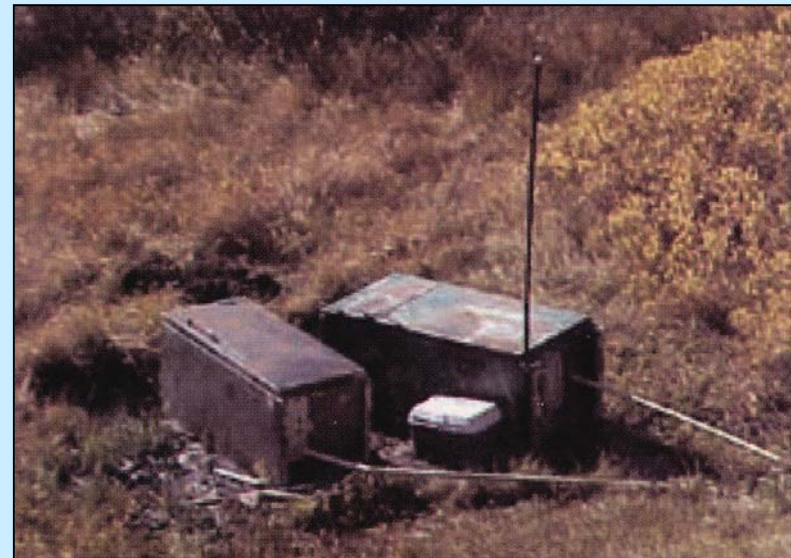
... powered by a solar panel to record fry exiting to the stream-brood ponds



The Shoshone-Bannock Tribe, Idaho, has successfully tested the “ fish detector” with NASA / Navy for Pacific salmon and steelhead trout connected to a NOAA satellite for fish data monitoring by tribal high school students



Incubator monitoring system



Friges on stream with satellite transmitter

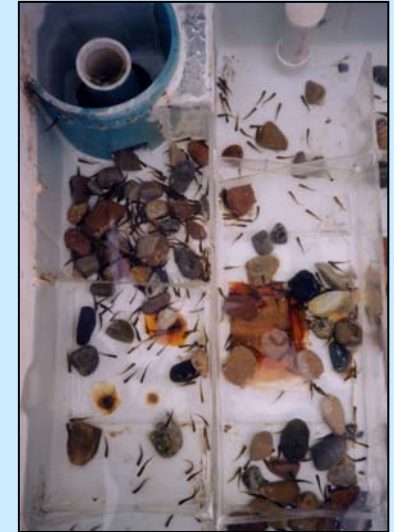
Streamside Incubators



... save your fridges for



... an incubator



... get 90% ± hatching success



... for native fish restoration



... from an 'ole fridge' a 5-pound Bonneville cutthroat



*... from an 'ole fridge'
a 5-pound Bonneville
cutthroat*