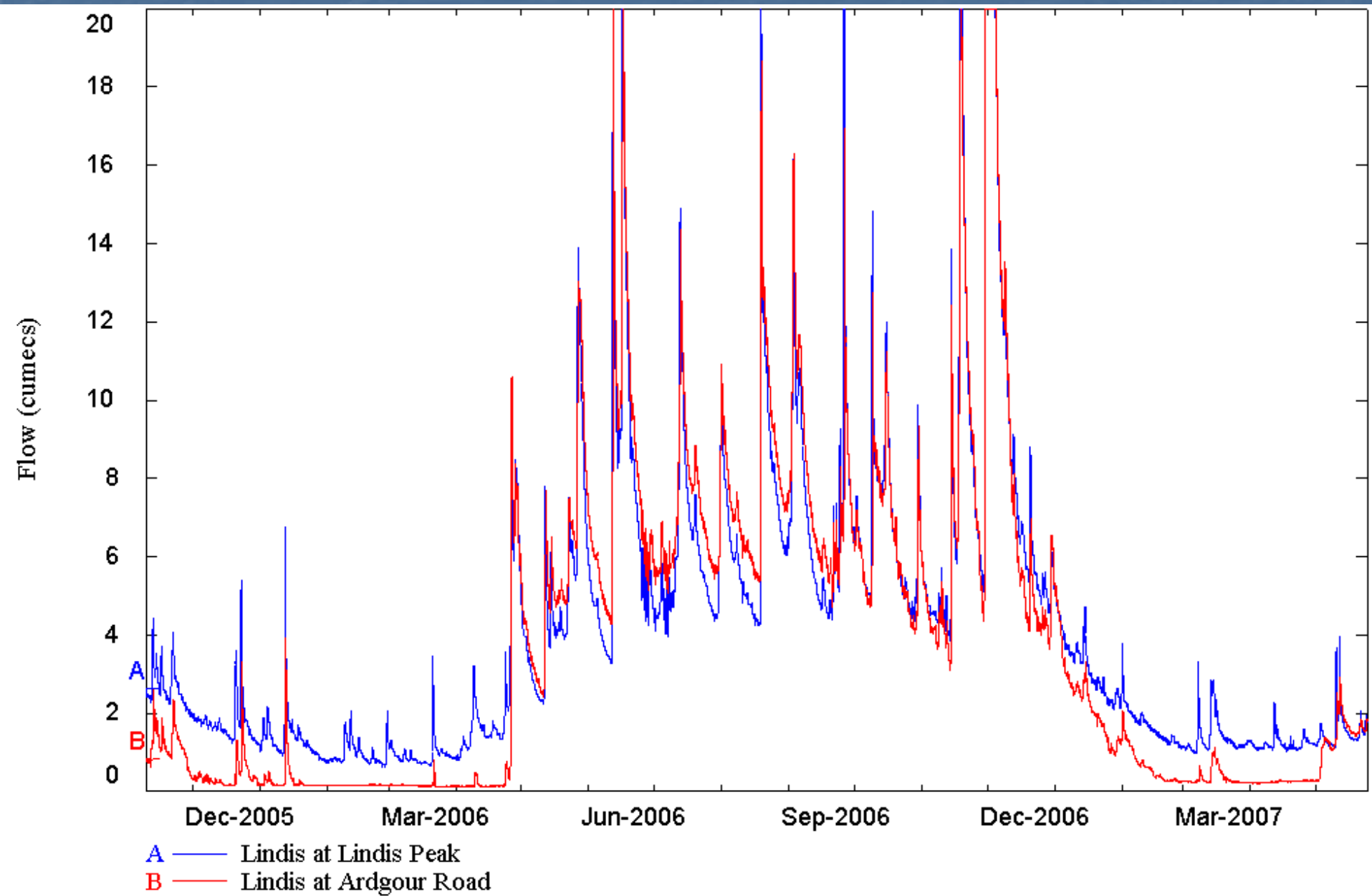


Hydrology and aquatic ecosystems of the Lindis River

Matt Dale: Otago Regional Council



Site	Data period	Term of record (years)	Catchment Area	Lowest recorded flow (m³/s)	MALF (m³/s)	SMALF (l/s/km²)
Lindis Peak	All year	31	542	0.186	1.394	2.572
Lindis Peak	Oct - April	31	542	0.723	1.616	2.982
Ardgour Rd	All year	2	1045	0.126	0.177	0.169

Native fish

■ Koaro

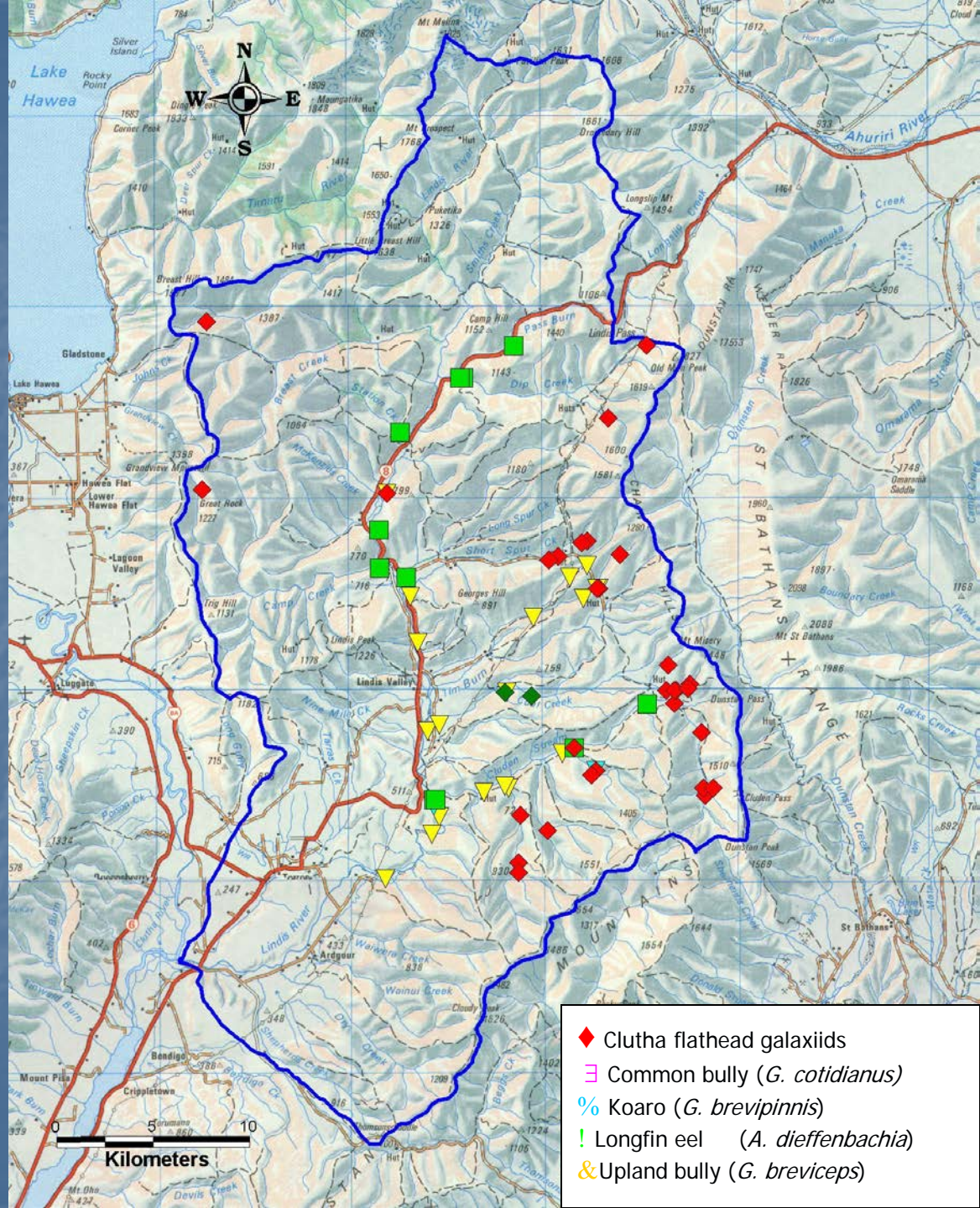
■ Common bully

■ Upland bully

■ Longfin eel

■ Clutha flathead galaxias

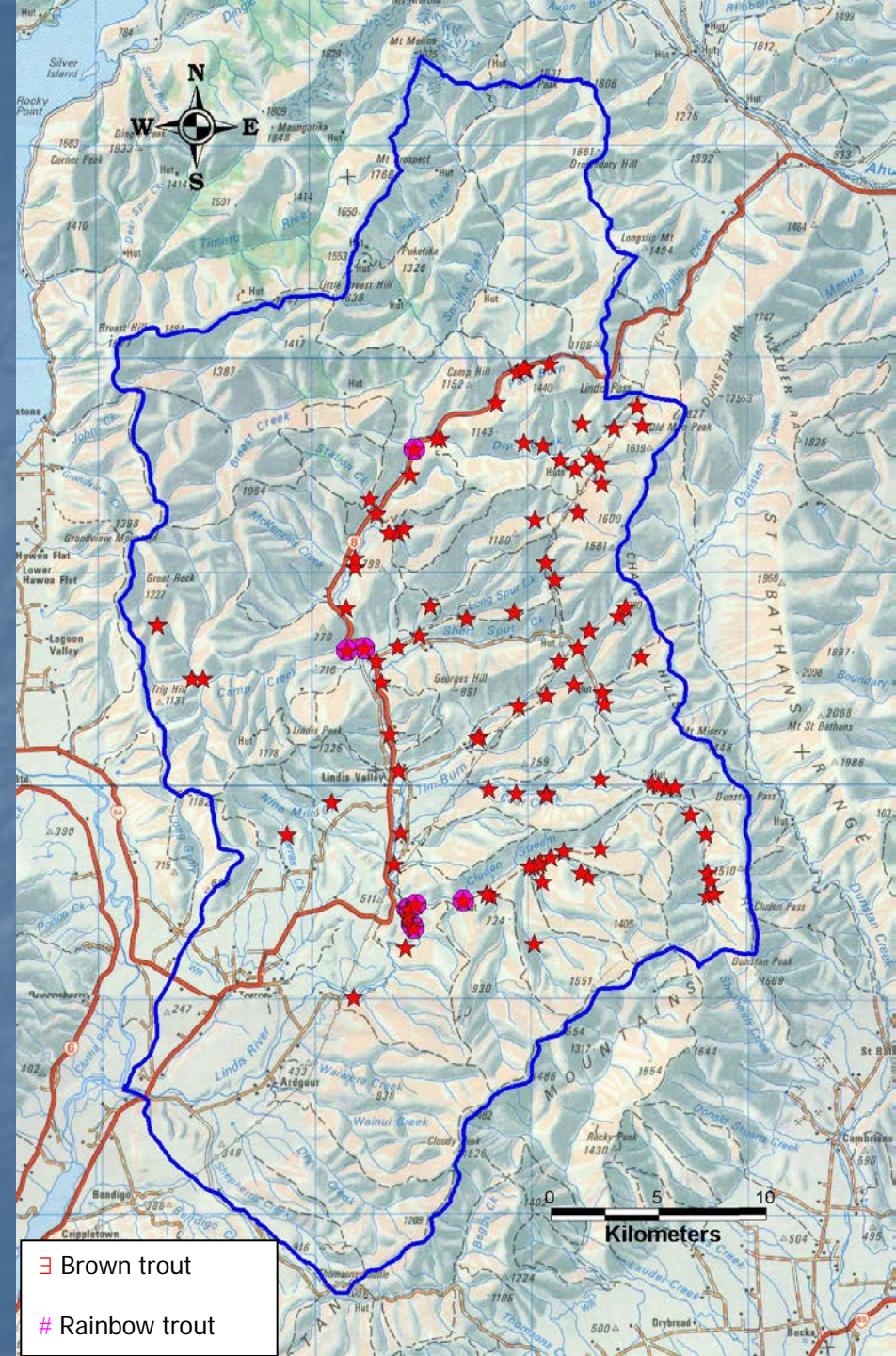
■ Clutha flathead galaxias is listed as being in gradual decline



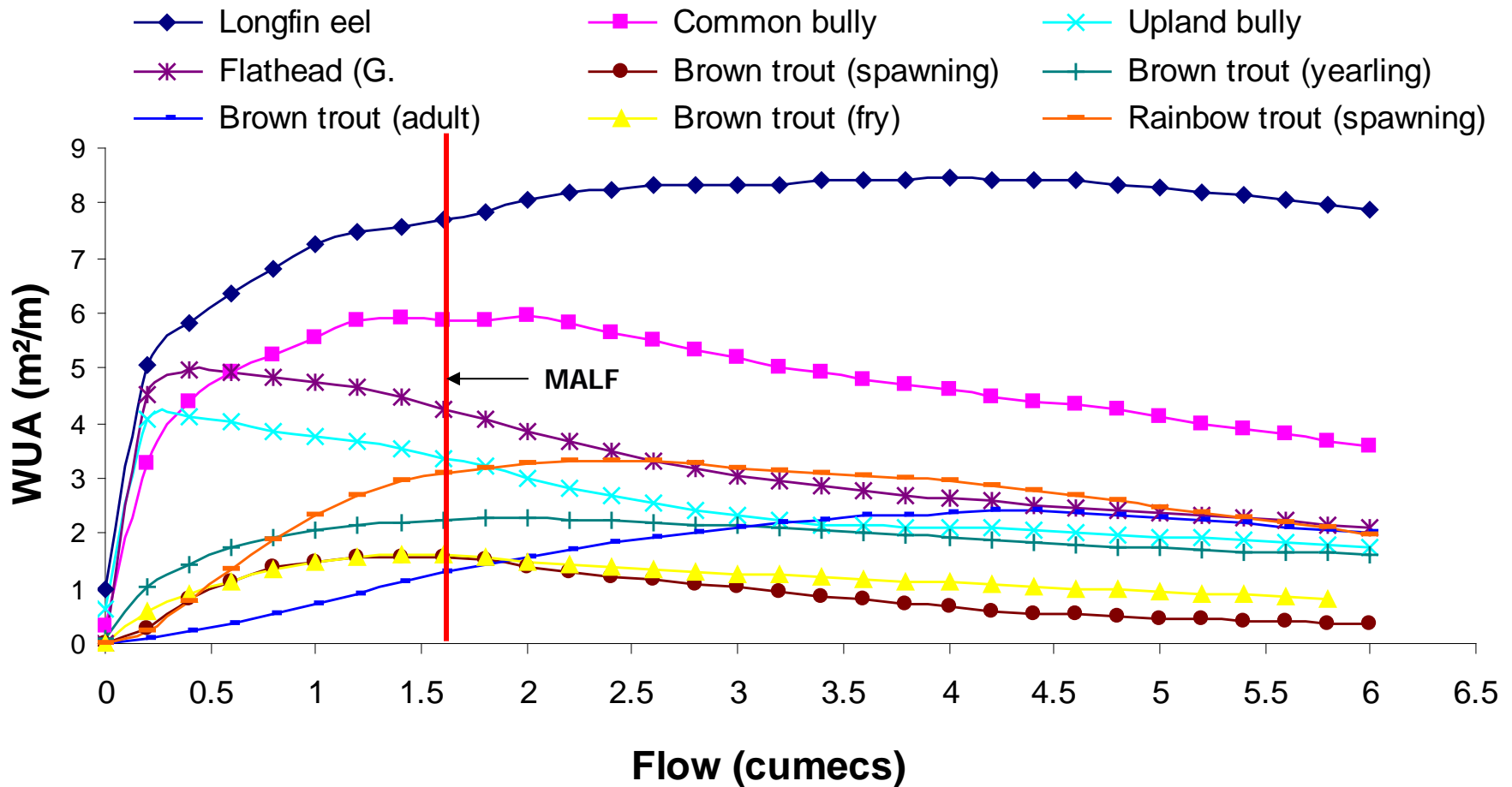
- ◆ Clutha flathead galaxiids
- Common bully (*G. cotidianus*)
- Koaro (*G. brevipinnis*)
- ! Longfin eel (*A. dieffenbachia*)
- & Upland bully (*G. breviceps*)

Introduced fish

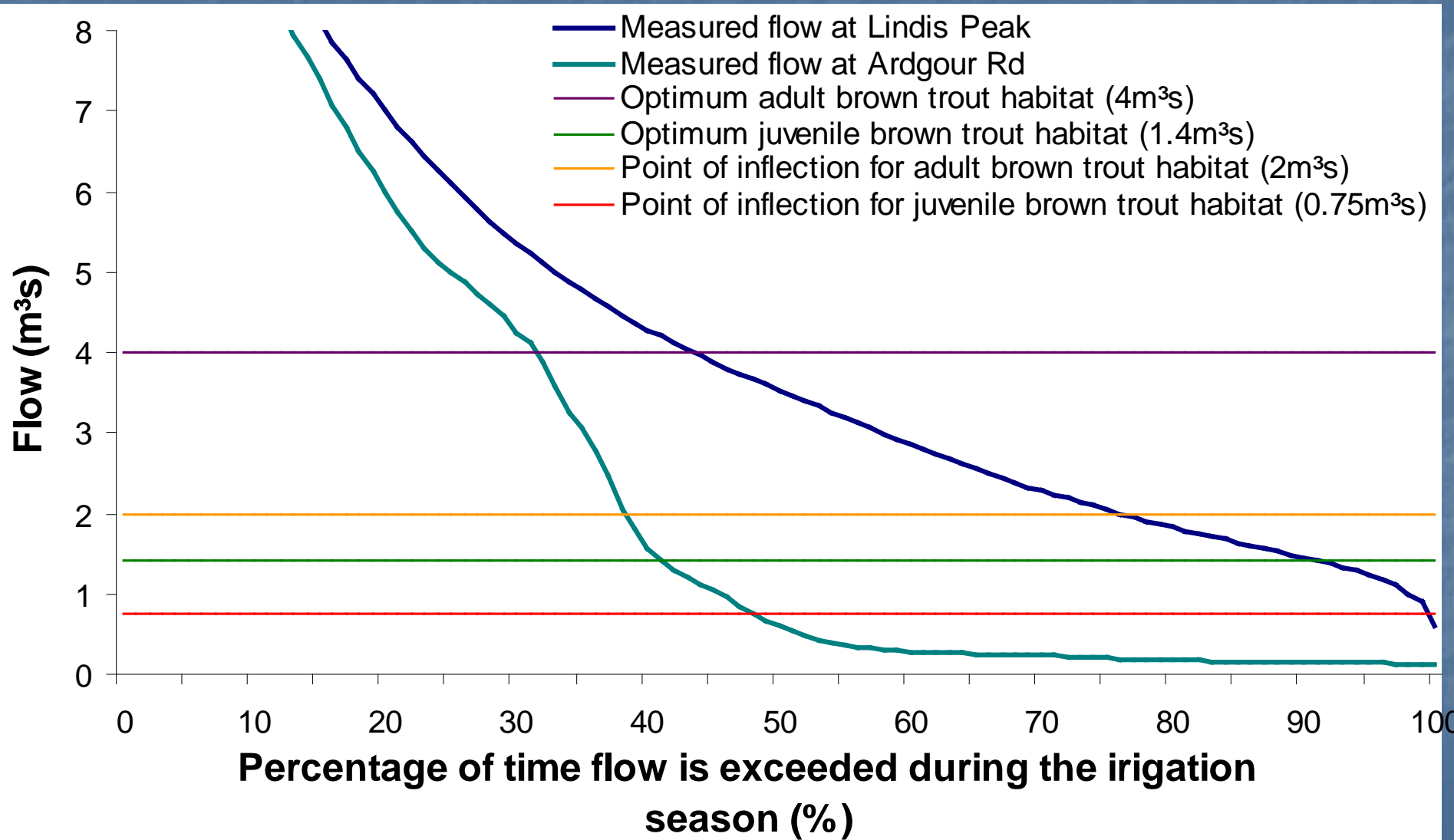
- Brown trout
- Rainbow trout
- Is considered a locally important brown trout fishery
- A study in 2002 (Unwin & Image) showed that approximately 150 angler days were spent on the Lindis during the 2001/02 season



Habitat study -

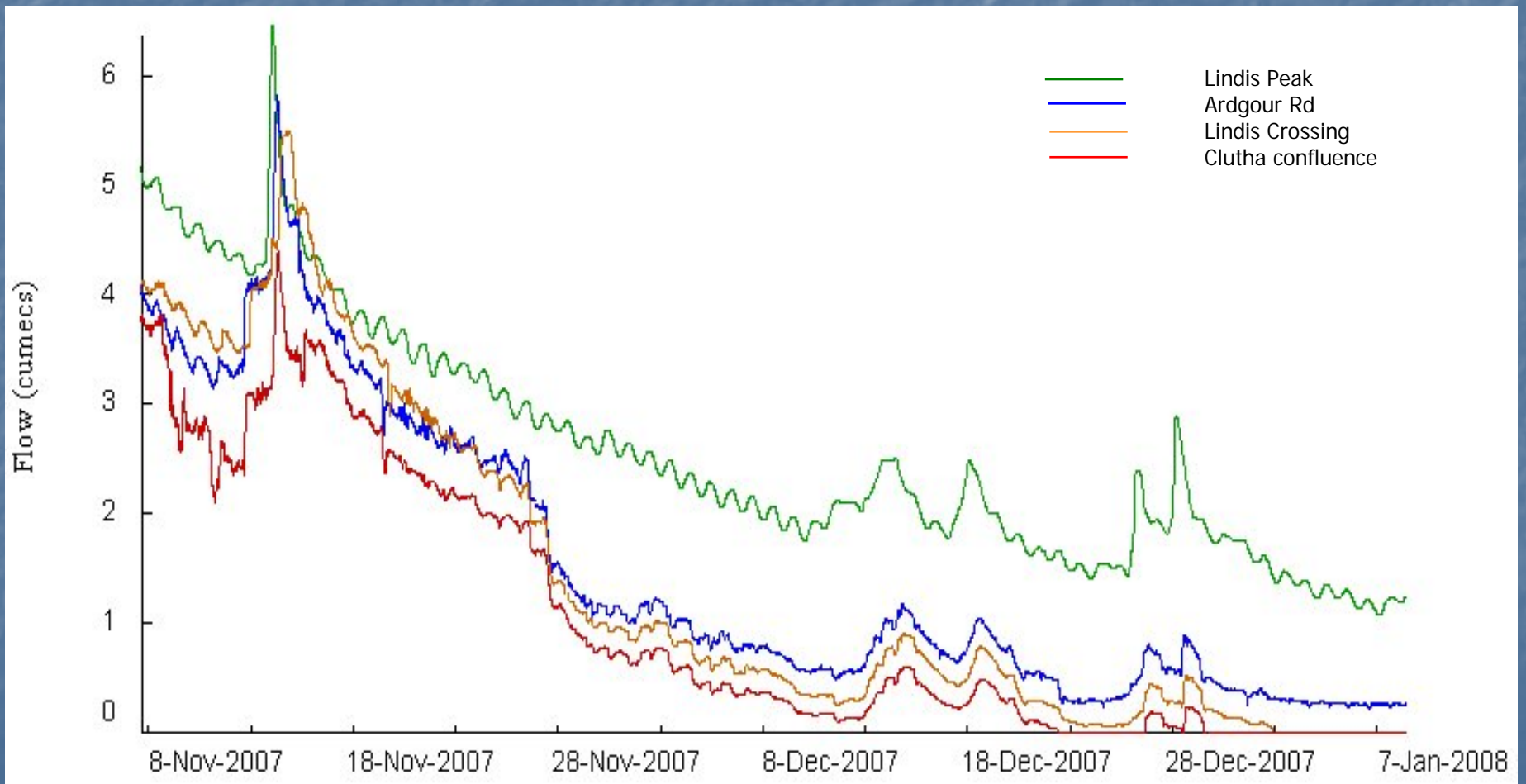


	Recorded 7-day mean annual low flow	Optimum Flow	Flow below which habitat declines sharply
Target fish species			
Upland bully, flathead galaxiid	1.6	0.4	0.2
Rainbow trout spawning (winter)	1.6	2.2	1.6
Brown trout spawning (winter)		1.4	0.75
Juvenile brown trout	1.6	1.4	0.75
Adult brown trout	1.6	4	2

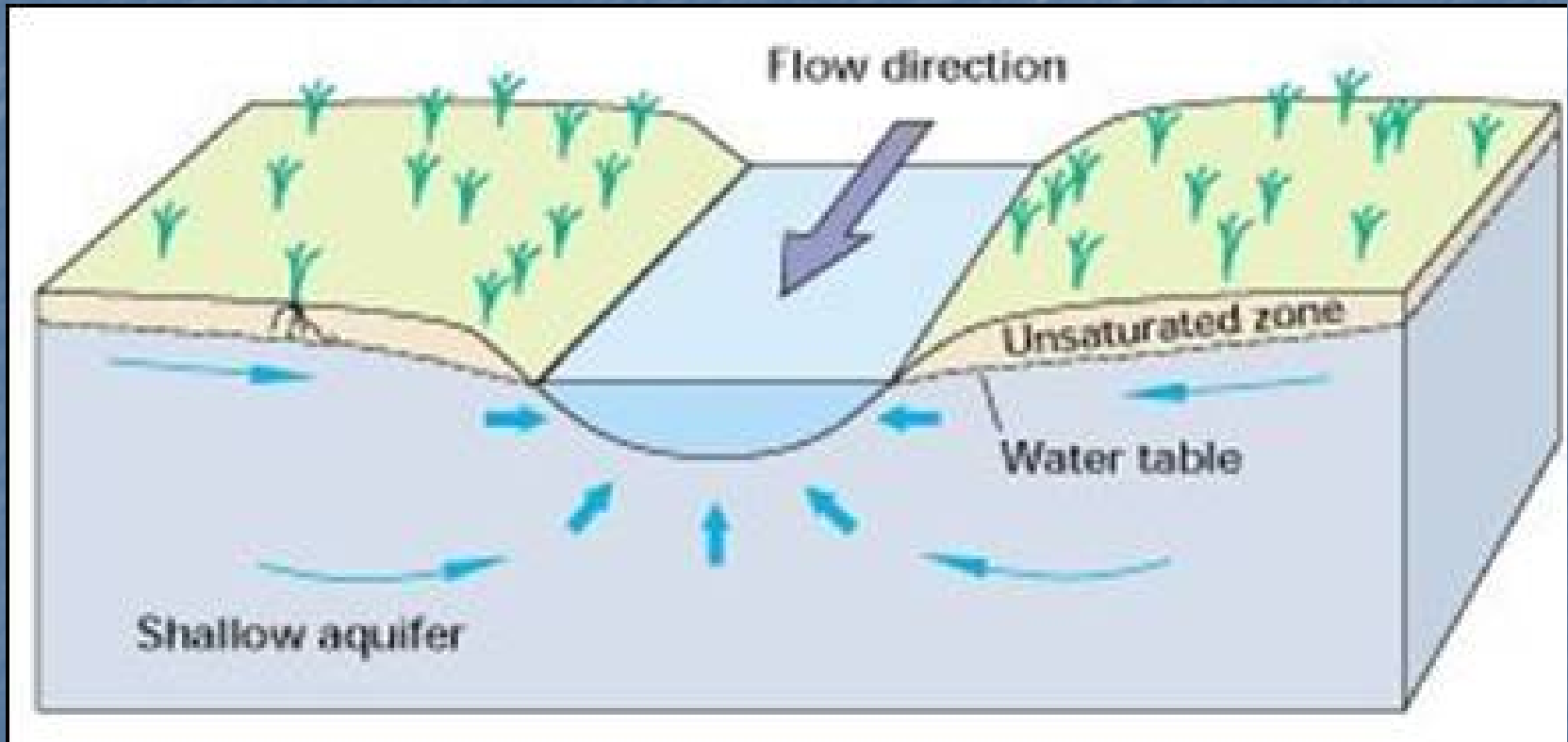


Hydrology of the lower Lindis

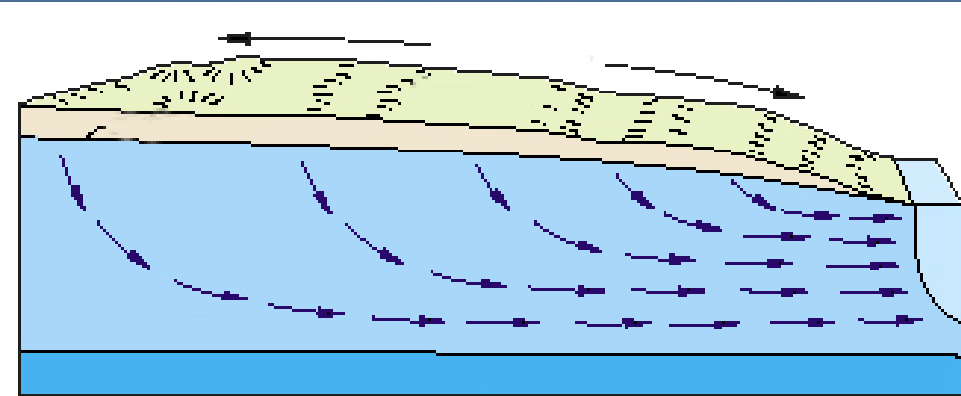




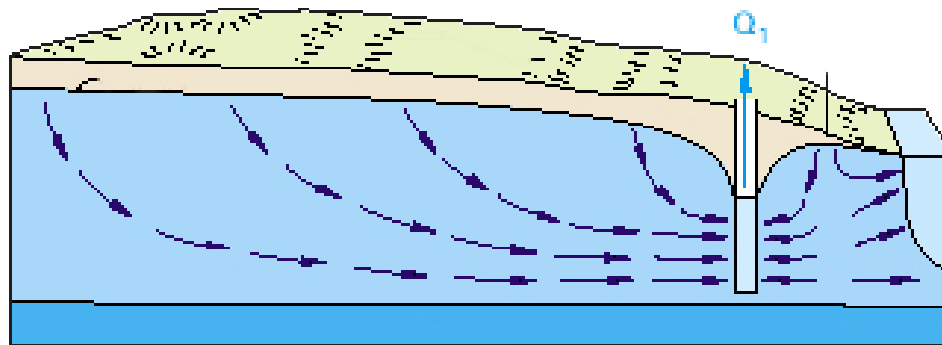
Gaining Section of River (Typical for Coastal Rivers)



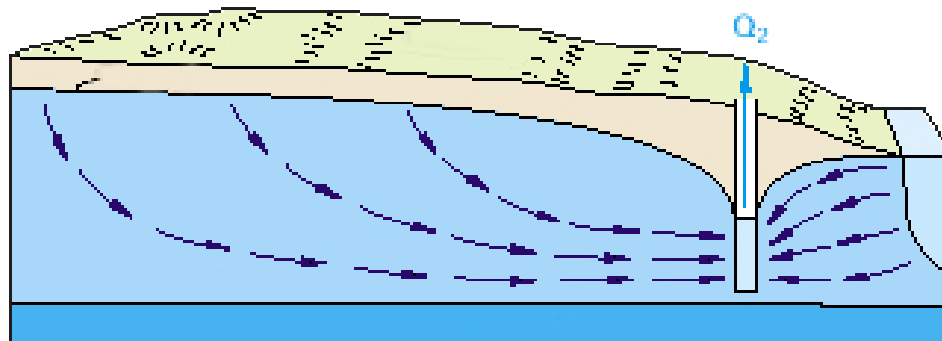
The different ways that groundwater & bores affect streams



Groundwater feeding a stream. No bore pumping.

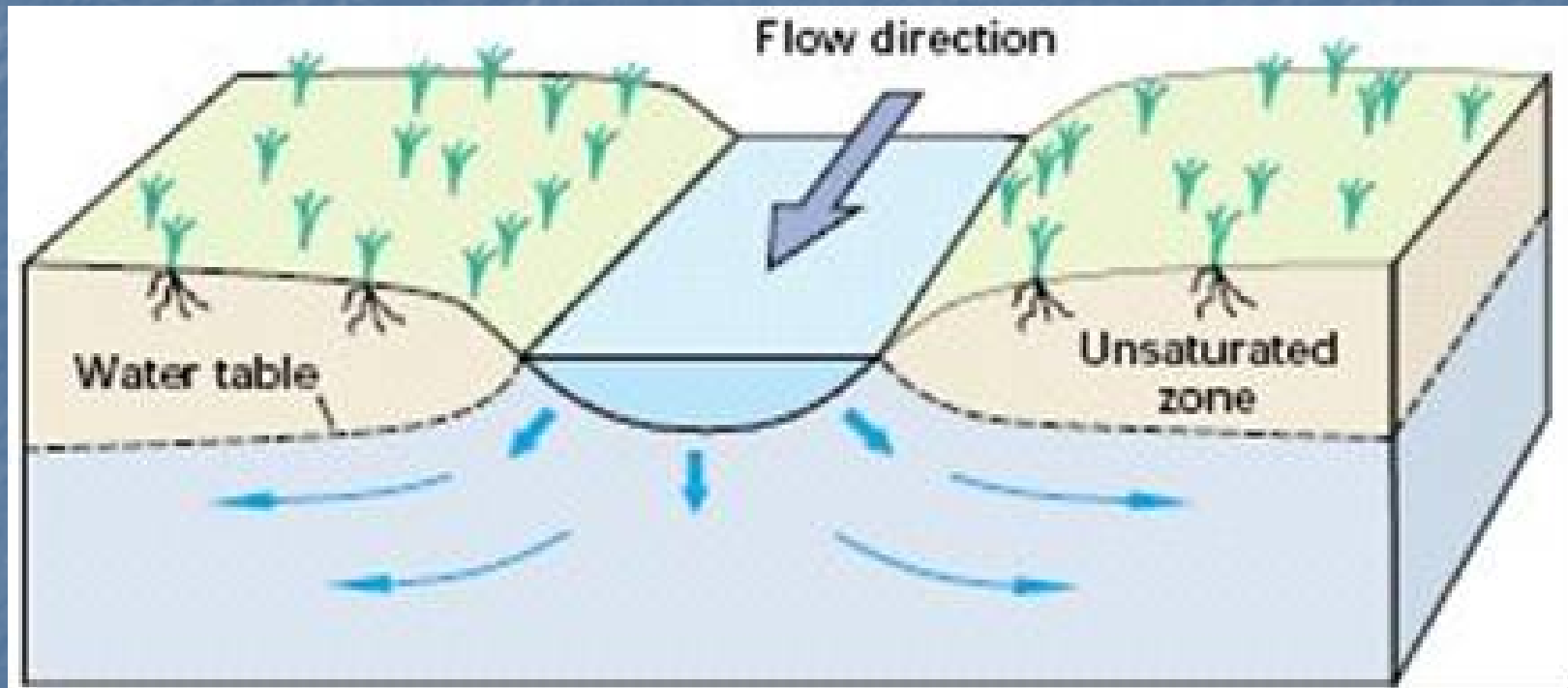


Bore pumping which reduces the water entering stream.

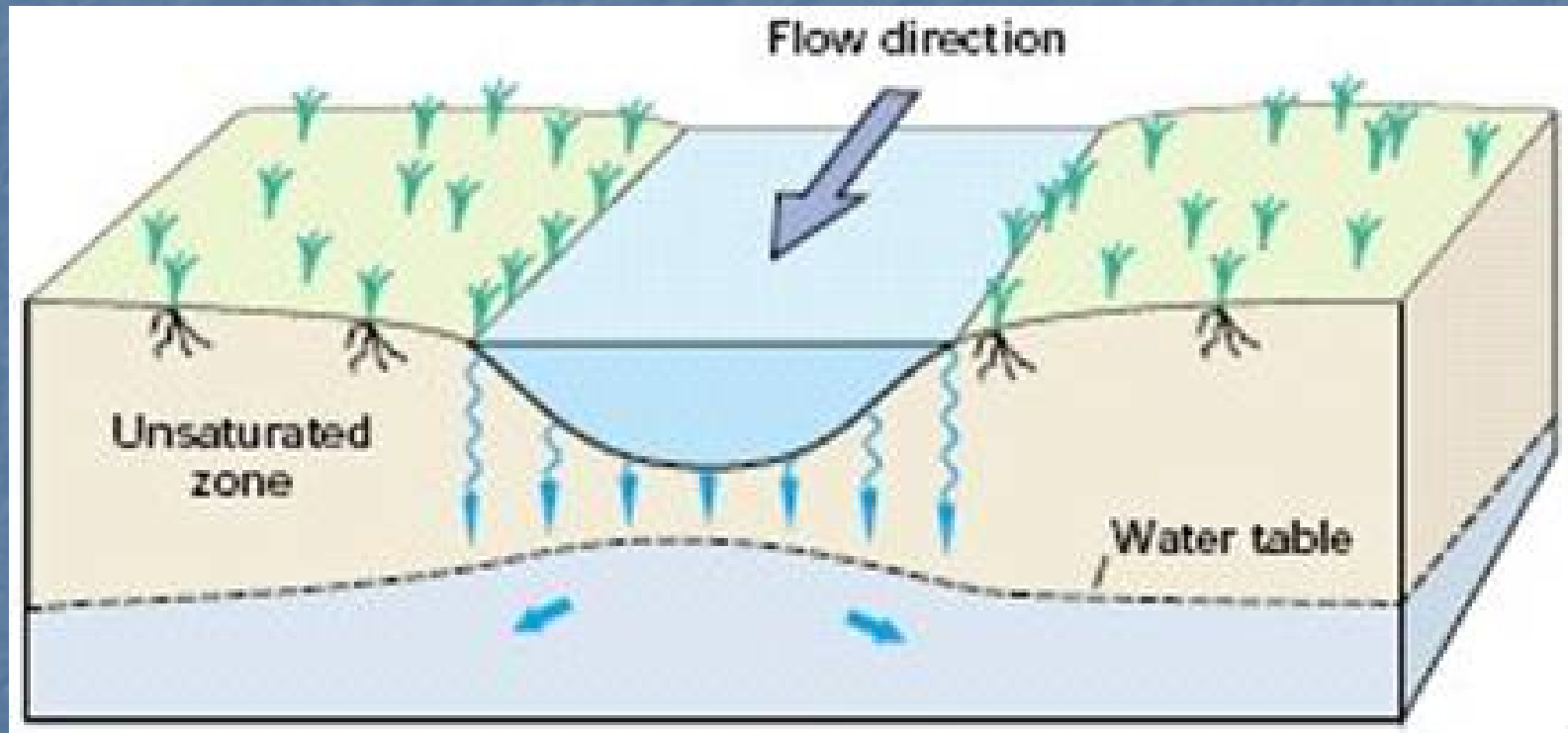


Bore causing water to leave stream.

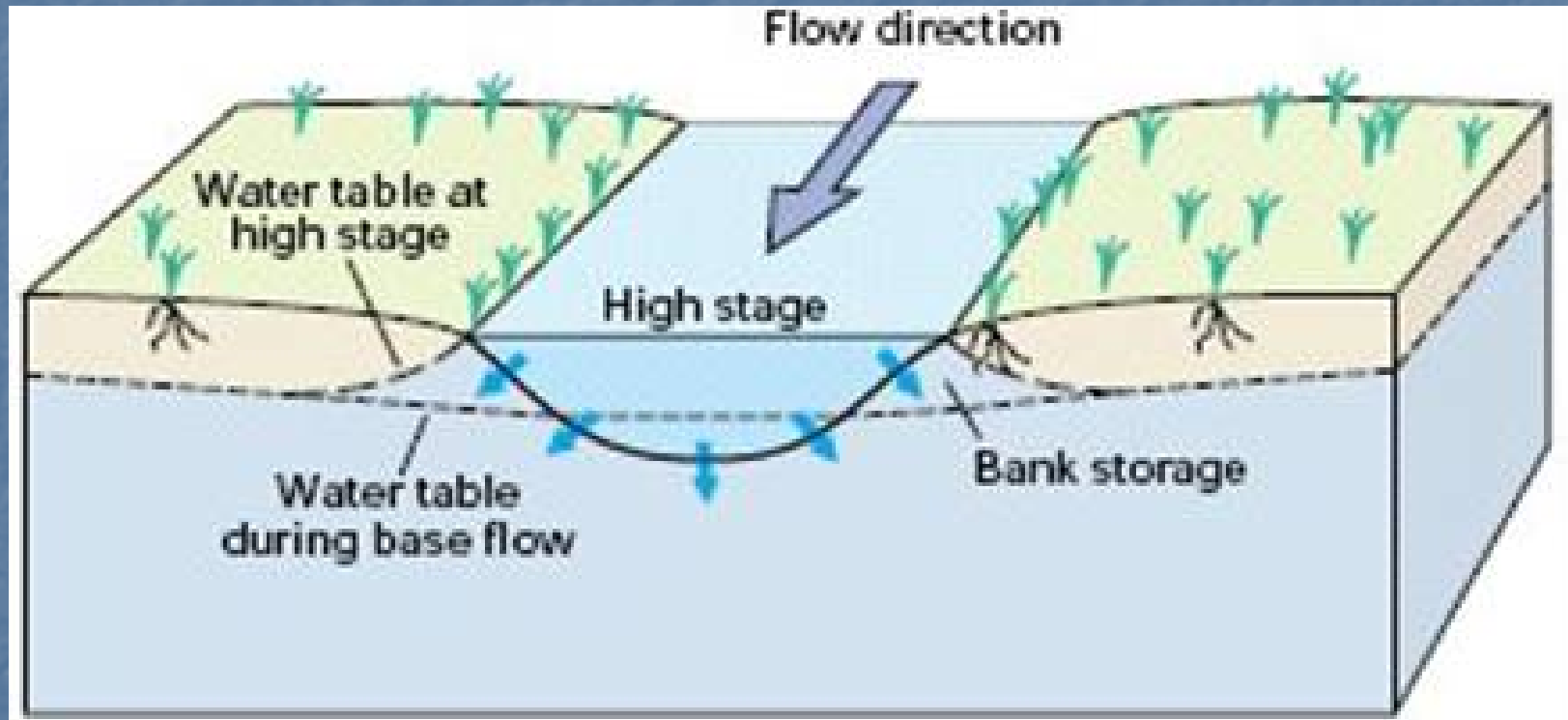
Losing Reach (More Typical of the Lower Lindis)



Disconnected Losing Reach (When water table falls below bed)

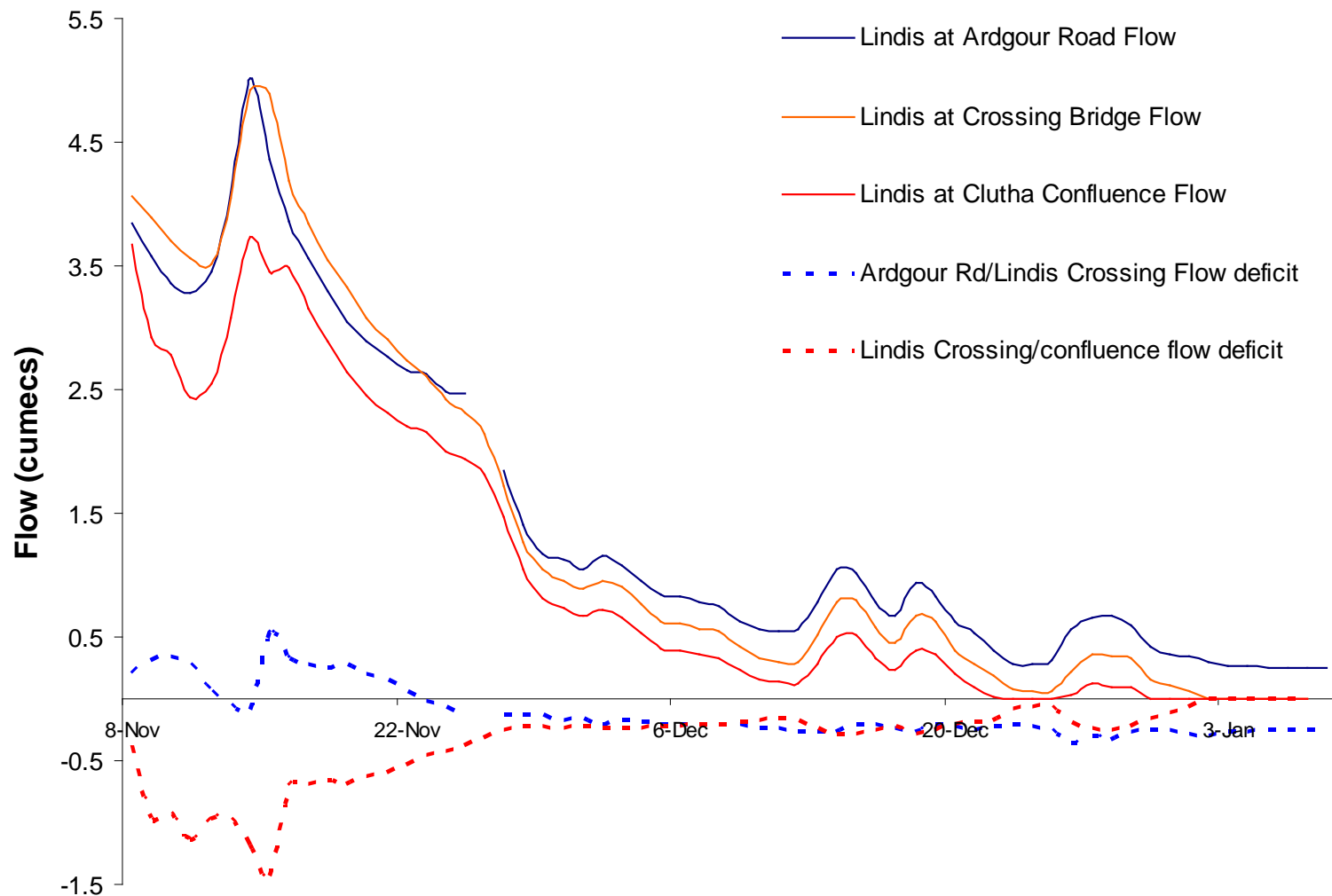


"Bank Storage" (Typically temporary, during flood)



Take Home Message on Groundwater

- The relationship between the river and water table can vary along the Lindis River.
- Whether the river gains or loses water to the water table is also dynamic in timing, depending on river flow rates and the level of abstraction.
- Losses to the water table cause the Lindis to dry up during low flows and abstraction will increase the number of instances when it does.



- Monitoring of flows in the lower Lindis showed that there is a constant loss of 0.44 (m^3/s) between the Ardgour Rd flow recorder and the Clutha confluence.

Age classes of brown trout in the lower Lindis River

