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The Saline Wedge

Drought does affect the movement of fish in the estuarine environment

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There is a balance of temperature, oxygen, salinity, and water in an estuary that is achieved before salmon can migrate from the marine environment into rivers and streams. When this balance is not achieved a form of toxicity takes place forcing salmon to either rush up stream or out to deeper seawater. When a drought plagues an estuary it becomes ripe to develop an uneven wedge of water between the two environments causing temperatures to rise, oxygen to deplete, and an abrupt increase in salinity (It is especially important in estuaries since water does not easily turnover and circulate). In most cases the introduction of freshwater (rivers, streams, and runoff) into saltwater creates a water column that forces saltwater nearer the seabed and freshwater closer to the surface creating a sort of wedge before mingling further out to sea. Any given area that suddenly becomes devoid of fish, during extended periods of high-pressure, is probably suffering from the dilemma of an increase of the "saline wedge" but though fish may have moved out they can be tracked even if the movement drives them miles from the estuary. Given the option of dying at sea or spawning salmon will migrate up those waterways that offer the ability to spawn even if it is not their place of birth. Scientists have observed this phenomenon for years while recreational fishermen remain largely uninformed. During a drought not only does the temperature of the estuary rise but heat depletes the necessary oxygen level of both environments, driving fish that have begun the process of transition from salt to freshwater upriver, and those that have not out of the area. Fishermen are left to assume that the run of fish was both small and short and abandon the estuary and go to other places to fish. Backtracking the migration of the run is the first thing anglers should consider before leaving the area entirely.



These two beautiful hatchery Chinook were taken during drought conditions where salinity increased and the fishing abruptly dropped off. After hooking these fish, I backtracked the entire school to another estuary 8 miles away where the outflow of freshwater dramatically increased; and so did the run of fish.

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Tides and large freshwater ways are the main variables to watch when backtracking. Strong tides during drought conditions transport salmon in the direction of the ebb tide. Salmon will not resist the pull of tides greater than 7 to 10 feet of movement. Follow the direction of the offshore current and fish the very first large system you find. Almost any map will show rivers and the larger the river the more likely you are to find holding fish. Drought does affect the movement of fish in the estuarine environment but those movements can be tracked by simple observations of weather and tides when fishing in proximity to smaller rivers and streams. The applications of the saline wedge work in any estuary. When fish go off the bite, during natal stream migration, ask yourself about the saline wedge.