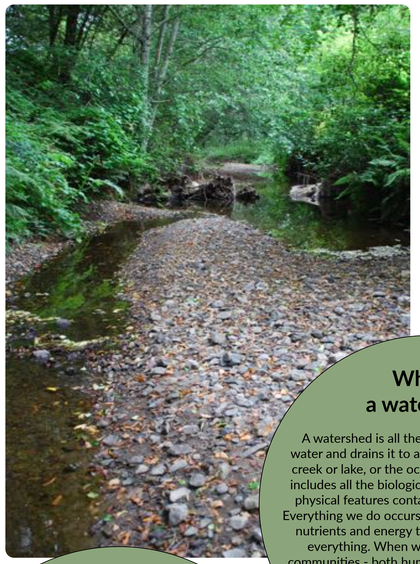
Coho Recovery in the Dutch Bill Creek Watershed



What is a watershed?

A watershed is all the land surface that collects water and drains it to a single exit point, like a local creek or lake, or the ocean. It's a catch basin which includes all the biological entities (including us) and physical features contained within its boundaries. Everything we do occurs in a watershed. Water cycles nutrients and energy through ecosystems, linking everything. When water is healthy and clean, communities - both human and non-human - thrive. When we mismanage our watersheds, everyone is impacted. A watershed is much more than just topography - it is a living, interconnected system.

Coho salmon is the keystone species for Dutch Bill Creek.

A keystone species is an organism upon which many other species in an ecosystem critically depend. Coho play a central role in the food web for hundreds of other plants, animals and microorganisms, and have sustained human cultures in this area for millennia. When salmon swim up river to spawn and die, they transport precious marine-based soil nutrients to fertilize inland forests, contributing to the health of the forest and all the life it supports. Coho are the biological foundation of this river/forest system. ***The presence or absense of coho in this waterway is an indicator of overall health of the watershed and all those who reside within it.***

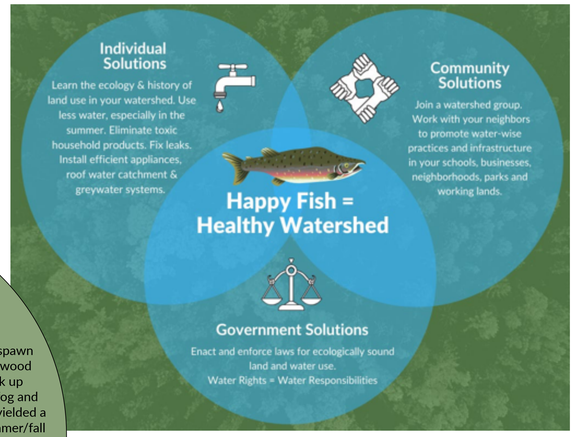
Fish need water all year round to complete their lifecycle.

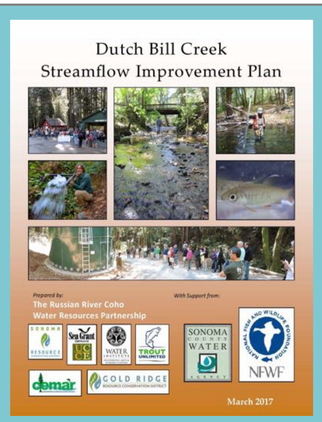
During the summer season, juveniles require cool, shaded pools in which to grow to maturity before swimming out to sea. Adults returning from the ocean need sufficient water depth to migrate back upstream to spawn. If creeks dry out, pools stagnate and become disconected, and fish get stranded and die.

In our mediterranean climate, streamflow in DBC is abundant in the winter months receiving between 3-5+ feet of rainfall between November and May. But in the dry season between May and October, when both human and agricultural water needs are the greatest, human impact on DBC watershed has left streamflow insufficient to sustain healthy fish populations. Data conclude that there is more than enough total surface water available to meet both human and environmental needs annually, but not in the summer. Collecting and storing rainwater during the winter for use during the dry months could supply sufficient water for humans all year round while minimizing impact on summer streamflow.

In the early 2000s, coho nearly reached extinction.

Historically, tens of thousands of coho would return to spawn in the Russian River each year. Towering primoridial redwood forests that once blanketed this region evolved to soak up abundant winter rain, pull down moisture from summer fog and keep the living sponge of the land hydrated - all of which yielded a consistent release of water into the creeks during the summer/fall months critical for rearing salmon. During the gold rush, the sudden influx of European settlers and the subsequent rush for "red gold" - redwood timber to build San Francisco- dramatically reduced the capacity of this living sponge. 150 years of deforestation, building of railroads and roads, and development of towns and vineyards have resulted in altered drainage networks, increased sediment load, water diversion from rivers, pollution, and general dehydration of the landscape. By the early 2000's streamflows dropped to a historic low. This trend of dehydration and the parallel loss of biodiversity is worsening with climate change.





Written collaboratively by the Russian River Coho Water Resources Partnership, the Dutch Bill Creek Streamflow Improvement Plan identifies specific measures to moderate the impact of dry season water demand and improve in-stream flow for coho salmon and ecosystem function in the Dutch Bill Creek Watershed. The goal is to work with water users and land managers to maintain a flow regime that protects the various life stages of salmon by managing water demand through water conservation, seasonal storage and other modifications to diversion practices and by augmenting flow through recharge, spring reconnections and other strategies.

This poster was produced by The Occidental Arts & Ecology Center WATER Institute, excerpted from the Dutch Bill Creek Streamflow Improvement Plan.

Scan this code or visit OAEC.org/water to download a copy of the Dutch Bill Creek Watershed Streamflow Improvement Plan, the Russian River Watershed Map or other OAEC WATER Institute publications.

The Russian River Coho Water Resources Partnership

Years of community organizing amongst diverse stakeholders and agencies resulted in the formation of the The Russian River Coho Water Resources Partnership. Established in 2009, with funding from the National Fish and Wildlife Foundation and Sonoma Water, the Partnership works to improve streamflow for fish and water supply reliability for human communities in five Russian River streams critical to coho recovery, including Dutch Bill Creek.

Learn more or get involved!
Visit the Russian River Coho Water Resources Partnership website at cohopartnership.org.

1995-present
Occidental Arts and Ecology Center (OAEC) creates an 80-acre conservation hydrology demonstration site in the DBC watershed, including sediment reduction, gully mitigation and groundwater recharge projects, fish-friendly roads, upland wildlife habitat enhancement projects, roofwater harvesting, greywater reuse, composting toilets and other water conservation measures.

1997
Dutch Bill Creek Watershed Group (DBCWG) forms.

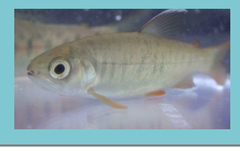
California Department of Fish and Game (CDFG) biologists complete Dutch Bill Creek habitat surveys which reveals a lack of habitat diversity, excessive sediment loading and fish passage issues.

1998
Salmon Creek Watershed Council hosts the first Salmon Creek Watershed Day celebration, which later becomes West County Watershed Day.

2000
OAEC develops the first 5-day "Basins of Relations: Starting and Sustaining Community Watershed Groups" training. Community members utilize the training to found and further develop several Sonoma County watershed groups, including DBCWG, Green Valley/Atascadero Watershed Council, Salmon Creek Watershed Council, and Friends of Mark West Creek. Basins of Relations alumni come together to create the West County Watershed Network.

2001
A "Watershed Moment": Coho spawn in Dutch Bill Creek! Westminster Woods environmental education staff find and document spawning coho in the reach adjacent to the camp.

2002
CDFG biologists find wild juvenile coho in Dutch Bill Creek. A percentage of these fish are collected for the new Russian River Coho Salmon Captive Broodstock Program. NOAA and CDFG recognize Dutch Bill Creek as a key watershed for coho recovery.



2004-2005
Culverts are replaced with a flatcar bridge at the Tyrone Road crossing of Tyrone Gulch, a Dutch Bill Creek tributary to facilitate fish passage. Dragonfly Stream Enhancement, supported by labor and funding from the Redwood Empire Chapter of Trout Unlimited, modifies the curbs on the "fishway" downstream of Westminster Woods as well as a number of channel-spanning rock weirs with jump pools below the fishway.

2005
Wild juvenile coho are observed in Dutch Bill Creek for the last time until 2011.

2006
West County Watershed Network, OAEC, Southern Sonoma RCD and county supervisors implement the Sonoma County Watershed and Creek Signage Pilot Project. Numerous signs are installed throughout the western and southern regions of the county.

2005-2007
Gold Ridge Resource Conservation District and Pacific Watershed Associates treat 80 erosion sites and upgrade or decommission 10.6 miles of road, preventing thousands of cubic yards of sediment from entering the stream.

2009
Camp Meeker Dam is removed! With the support of the Camp Meeker community, Gold Ridge RCD also implements Market Street Fish Passage Project.

2009
Russian River Coho Water Resources Partnership forms

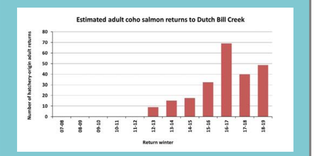
2010-2011
Adult coho are observed returning to Dutch Bill Creek after five years with no adult or juvenile observations.

2013-2016
Dutch Bill Creek Large Woody Debris Project is implemented; 27 large woody structures are installed to improve spawning and rearing habitat.

2015 & 2016
Camp Meeker Recreation and Park District releases flow into Dutch Bill Creek to maintain pool connectivity for coho salmon during the drought.

2016
Westminster Woods Water Conservation and Storage Project is completed. The project eliminates Westminster Woods' summer diversion from Dutch Bill Creek through a combination of water conservation and tank storage.

2019
CA Sea Grant's Russian River Salmon and Steelhead Monitoring Program estimates the total number of adult coho salmon returning to spawn in DBC is likely around 50 individuals.



2017
Dutch Bill Creek Streamflow Improvement Plan is published.