NOAA FISHERIES

West Coast Region, Santa Rosa Office Area

Stream Flow Augmentation Agreements to Benefit Salmonids

A Collaborative Drought Response in the Russian River

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National Marine Fisheries Service
October 21, 2015

Background

- 2010
  - **Porter Creek** stream flow augmentation project
    - 50 acre-feet of reservoir water released into the stream
    - Provides summer rearing flows for 1.5 miles
      - Captive bred coho salmon are released
    - Additional pulse flows for smolt outmigration in 2015
      - Over 500 coho salmon smolt emigrated
- 2014
  - Gov. Brown declares a **Drought Emergency**
  - NMFS and CDFW develop the **Voluntary Drought Initiative Policy (VDI)**
  - Porter Creek project signed as the first flow augmentation VDI
- 2015
  - The State Water Resource Control Board (SWRCB) adopts **Emergency Drought Regulations for the Protection of Specific Fisheries** in 4 tributaries of the Russian River: Green Valley, Dutch Bill, Mill, and Mark West creeks
    - Includes mandatory water conservation measures
  - Three additional flow augmentation VDI's are implemented in 2 of the 4 tributaries
  - Additional non-flow enhancement VDI's
    - 41 water conservation and fish rescue agreements signed with CDFW
    - 71 winegrape growers representing 1,900 acres of vineyard have pledged to reduce water demand this season by 25 percent

Ben White from the Russian River Coho Salmon Captive Broodstock Program releases coho salmon into Porter Creek, Nov. 20, 2014

Camp Meeker VDI: Dutch Bill Creek

- Camp Meeker Recreation and Parks District (CMRPD) volunteered to enhance critically low summer flows **in Dutch Bill Creek to protect coho salmon**
- CMRPD committed to releasing raw water from its water supply pipeline **continuously through November** or until flows are restored from rainfall events
- **Water is sourced from** two offset wells adjacent to **Russian River mainstem** near Monte Rio
  - It is then piped under Bohemian Highway to Alliance Redwoods Conference Grounds (ARCG)
  - Untreated water is then released from a 7,500 gallon storage tank via flexible PVC piping into a rock-lined channel which flows into Dutch Bill Creek

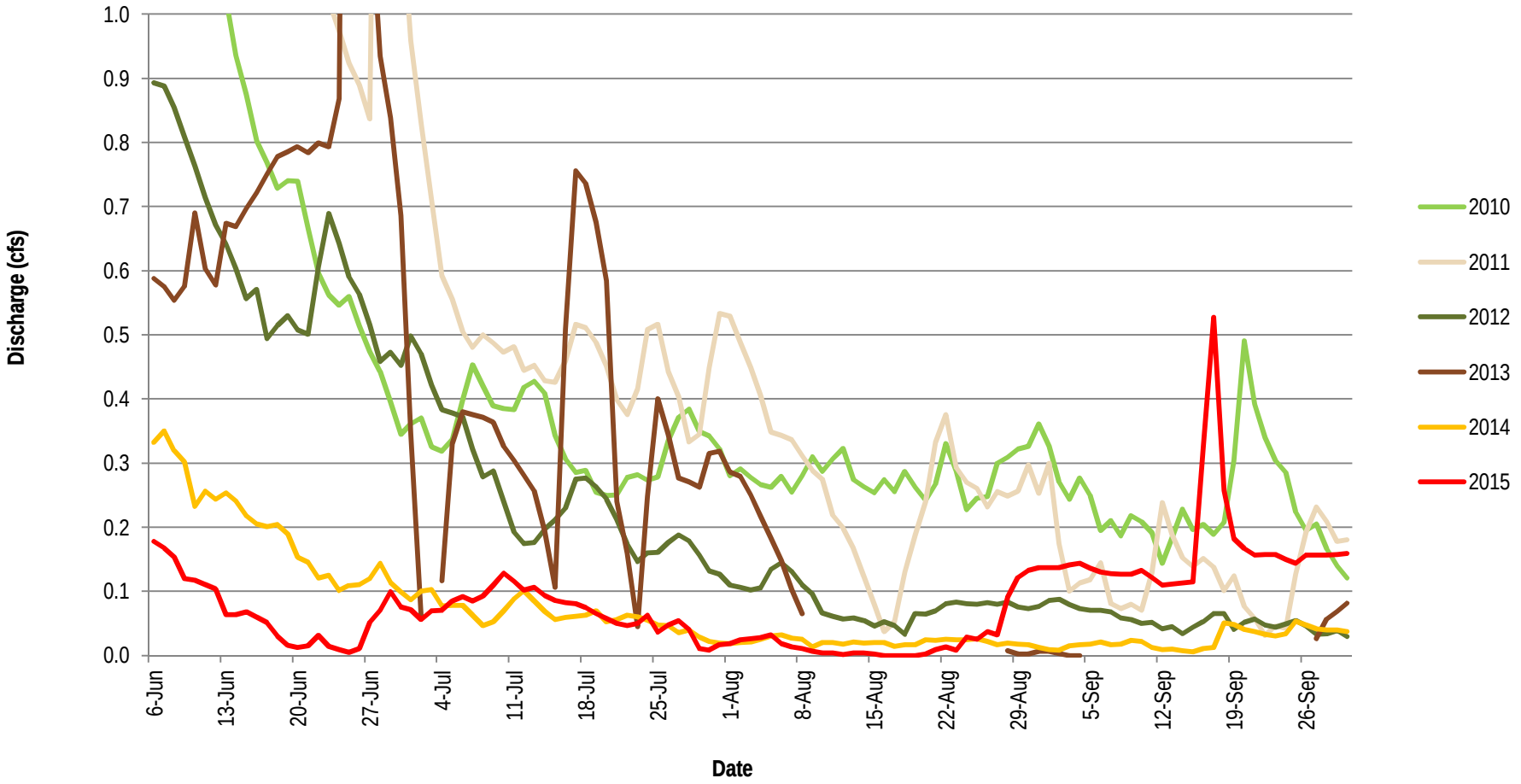
Brock Dolman, from the Occidental Arts and Ecology Center, displays the release of water into Dutch Bill Creek

- **Partners** include: CMRPD, ARCG, the Gold Ridge Resource Conservation District, Trout Unlimited, the Occidental Arts and Ecology Center, the Russian River Coho Salmon Captive Broodstock Program, the State Water Resources Control Board, the North Coast Regional Water Quality Control Board, CDFW and NMFS

Camp Meeker VDI: Dutch Bill Creek

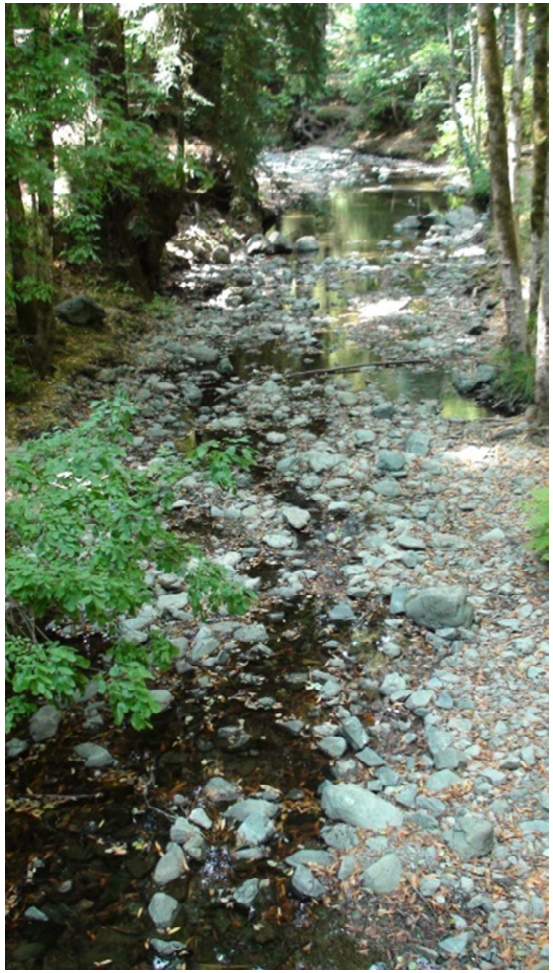
- Baseline flow in Dutch Bill Creek was almost zero
  - 0.02 cubic feet per second (cfs)
- Approximately **3,400 juvenile coho salmon and steelhead** were likely to perish
- Flow augmentation was initiated on August 25 at a rate of 45 gallons per minute (gpm)
- Surface flow has increased at least one mile downstream
  - Stream flow below release point has increased to 0.11 cfs
  - **Hydraulic connectivity has been re-established** and enhanced
- Water quality of the release water has been consistently good
  - Temperatures range between 15° and 18° Celsius
  - Dissolved oxygen is greater than 7 milligrams per liter - mg/l

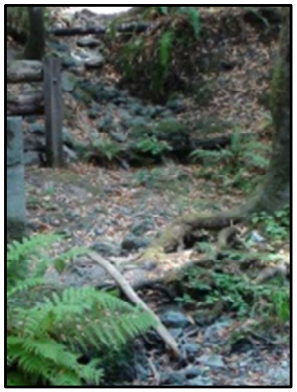
Dutch Bill Creek - Average Daily Discharge by Year (2010-2015)



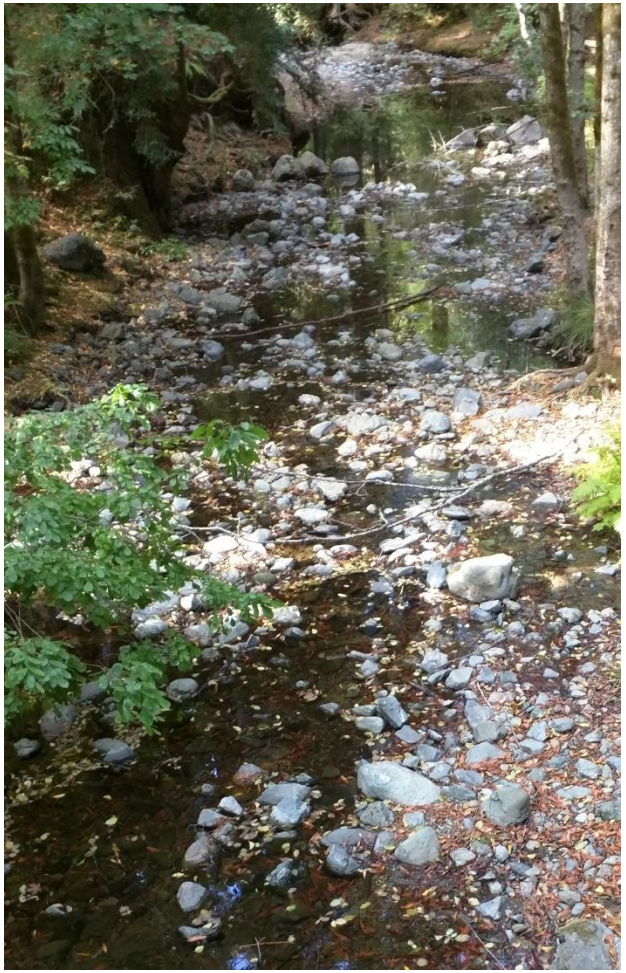
Camp Meeker VDI: Dutch Bill Creek

Before

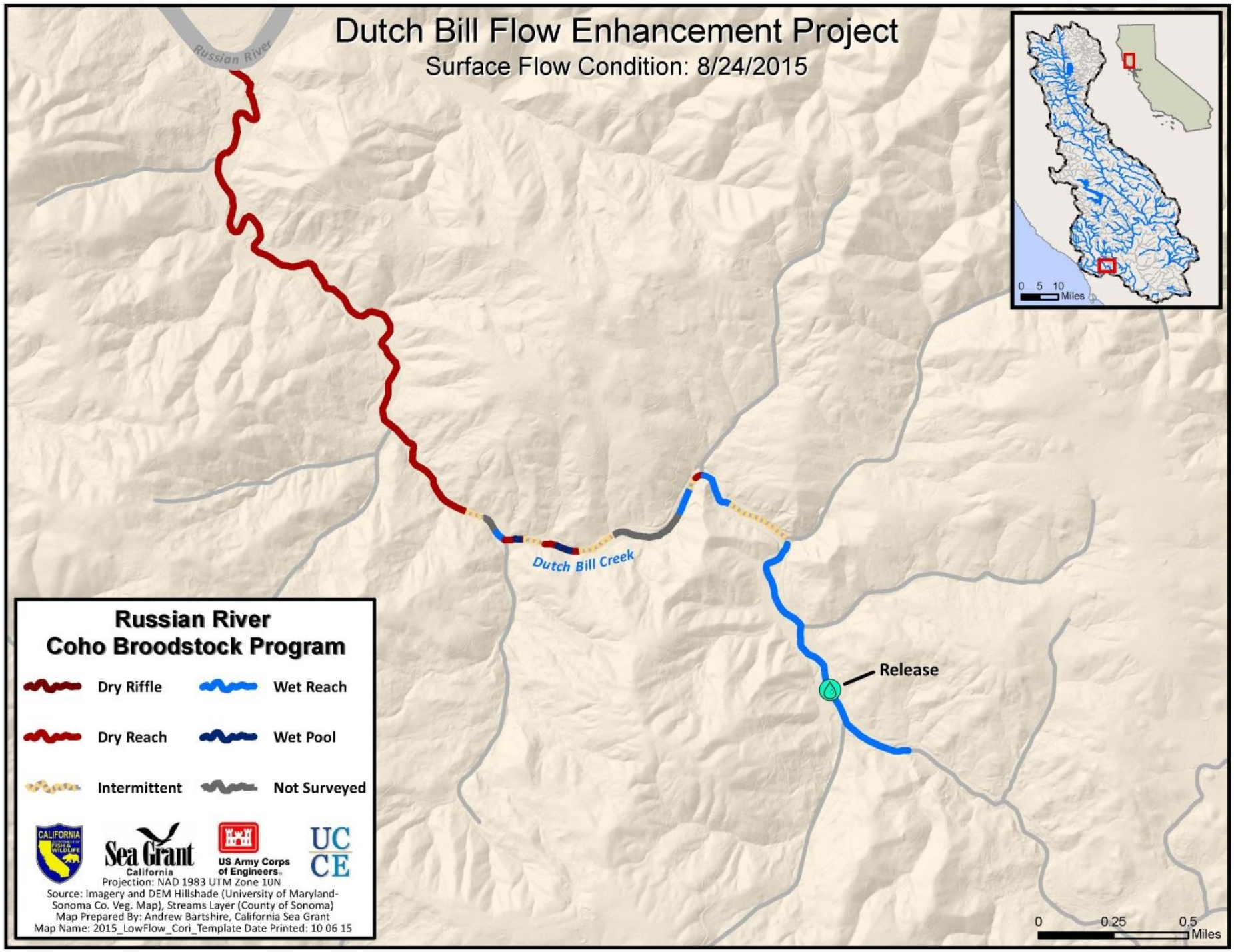


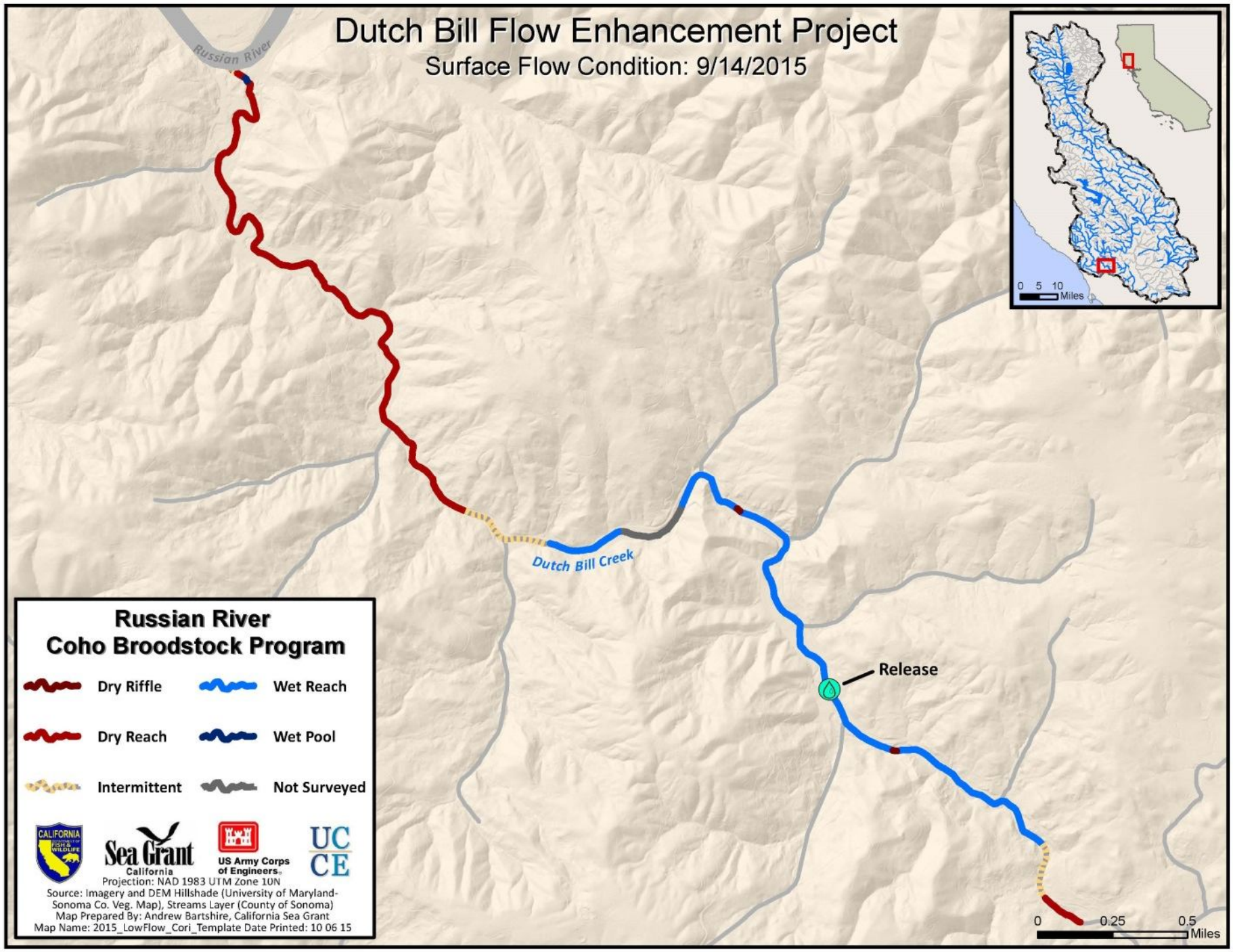


After



Point of Flow Input


Dutch Bill Flow Enhancement Project
Surface Flow Condition: 8/24/2015
Russian River
Dutch Bill Creek
Release
0 5 10 Miles
Russian River
Coho Broodstock Program
Dry Riffle
Wet Reach
Dry Reach
Wet Pool
Intermittent
Not Surveyed
Sea Grant California
US Army Corps of Engineers
UC CE
Projection: NAD 1983 UTM Zone 10N
Source: Imagery and DEM Hillshade (University of Maryland-Sonoma Co. Veg. Map), Streams Layer (County of Sonoma)
Map Prepared By: Andrew Bartshire, California Sea Grant
Map Name: 2015_LowFlow_Cori_Template Date Printed: 10 06 15
0 0.25 0.5 Miles


Dutch Bill Flow Enhancement Project
Surface Flow Condition: 9/14/2015
Russian River
Dutch Bill Creek
Release
0 5 10 Miles
Russian River
Coho Broodstock Program
Dry Riffle
Wet Reach
Dry Reach
Wet Pool
Intermittent
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Conclusions

- A few exceptional **volunteers can make a big difference**
  - Only a small amount of water is required
    - 45 gpm = 0.1 cfs, 3 month total = 18 acre-feet
- But, the restoration and **conservation of functional ecosystems** is a more effective and reliable solution
  - Springs and seeps are the natural source of summer flows
  - Summer flows are a critical lifeline for the salmonid life-cycle
- VDI's have been a tremendous complement to the Emergency Regulations
  - But they are not likely to replace the need for **comprehensive regulation** of water uses