

### SCWA Easements

- █ Owned In Fee-Engineered Channel
- █ Easement Engineered Channel
- █ Easement Modified Channel
- █ Easement Natural Channel

### Elevation, ft.

- |   |  |
|---|--|
| <span style="color: cyan;">█</span> Below Sea level | <span style="color: lightyellow;">█</span> 250 - 500   |
| <span style="color: darkgreen;">█</span> 0 - 25     | <span style="color: yellow;">█</span> 500 - 1,000      |
| <span style="color: green;">█</span> 25 - 50        | <span style="color: orange;">█</span> 1,000 - 1,500    |
| <span style="color: lightgreen;">█</span> 50 - 75   | <span style="color: brown;">█</span> 1,500 - 2,000     |
| <span style="color: yellowgreen;">█</span> 75 - 100 | <span style="color: darkbrown;">█</span> 2,000 - 2,500 |
| <span style="color: yellow;">█</span> 100 - 250     | <span style="color: darkred;">█</span> Above 2,500     |

- SCWA Flood Control Zone Boundary
- █ Water Bodies
- ~ Streams
- City Limits
- Reach Maps Index

Figure 4-1  
Windsor Subbasin



1:66,000

Sources:  
Sonoma County Water Agency  
County of Sonoma  
California Spatial Information Library





E:\2008Projects\Horizon\SCWA\SMP\GIS\Layers\Ch-4\ReachVeg\_Windsor.mxd MG 12-08-08



### Vegetation Type

- Blackberry Scrub
- Mixed Riparian Scrub
- Riparian Woodland (full canopy)
- Riparian Woodland (up to 75% canopy)
- Riparian Woodland (up to 25% canopy)
- Riparian Forest
- Ruderal
- Willow Scrub
- Developed

Sources:  
Sonoma County Water Agency  
County of Sonoma  
AirPhotoUSA, 2005

**FIGURE 4-2**  
**Reaches and Vegetation**  
**Windsor (1 of 4)**

0 500 1,000 1,500 2,000  
Feet  
1 inch equals 1,000 feet

# Windsor Creek – Reaches 4 & 3

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**JURISDICTION:** Owned in-fee and maintained by SCWA

**LOCATION:** Reach 4: Brooks Rd. to Natalie Dr.  
Reach 3: Natalie Dr. to ~500ft downstream

**ADJACENT LAND USE:** Residential

**UPSTREAM:** Non-SCWA maintained reach

**LENGTH:** Windsor 4: 1,755 ft.  
Windsor 3: 512 ft.

**CHANNEL EASEMENT CORRIDOR WIDTH:**

Windsor 4: 124 ft.

Windsor 3: 135 ft.

**AVERAGE TOP-OF-BANK WIDTH:** Windsor 4: 79 ft.

Windsor 3: 81 ft.



(b) Mid Reach 4, looking downstream. Note cut stump in foreground, this section of Reach 4 has experienced recent vegetation thinning and removal. Channel morphology includes pool and riffle sequences throughout Reaches 4 and 3 (Nov 2008).



(a) Upper Reach 4 looking downstream, right bank shows widespread bank erosion with an area of failure approx. 50-75 ft long. The sands from this eroding bank appear to be the source of numerous bars forming in and along the channel downstream (Nov 2008).

## PHYSICAL CONDITIONS

**Reach setting:** Reaches 4 and 3 are east of Hwy 101 flowing north to south along the base of the Mayacamas Mtns. These reaches represent a transition zone at the foot of the mountains that moves from the steeper canyon drainages (photo b) into the alluvial fan zone (photos c/d) and finally into the alluvial plain drainages downstream of Hwy 101.

**Active channel:** narrow in higher gradient and incised sections (3-6 ft wide), widening to 10-14 ft by Natalie Dr.; flow depths 1" to 2' deep with some larger pools and runs.

**Bed sediments/texture:** bars are either exposed or underlain with gravel and cobbles; recent sandy deposits from eroding banks (photo a) transported downstream.

**Bank structure:** steep mostly 1:1 or greater; deeply incised with a mix of riprap and earth.

**Channel processes:** Windsor 4 channel is incising and causing additional bank erosion and bank failures (photo a); traveling downstream the channel changes from incising to aggrading and sediment fines. It appears that chronic bank failures upstream are contributing to bar and wedge formations downstream.

**Water quality (qualitative):** moderate to good with clear flowing water in most places in November 2008.

# Windsor Creek – Reaches 4 & 3

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## BIOLOGICAL CONDITIONS

*Instream habitat:* Aquatic habitat in Reach 4 is relatively good with pools and riffles, undercut banks, gravel bars, and some woody debris. This habitat is, however, severely impacted by bank failures and fine sediment wedges filling pools and covering riffles. Aquatic habitat in Reach 3 is not as good as Reach 4 as channel has more areas dominated by diffuse flow through large sediment wedges, which are usually associated with rock weirs or eroded rip-rap spanning the channel.

*Vegetation composition:* Canopy trees include a string of willows along the toe of slope throughout both reaches and an assortment of live oak, bay, ash, and buckeye on the banks. Top of banks have been planted with Manzanita and coyote brush. Understory vegetation includes blackberry, periwinkle, annual grasses and lots of duff. Wedges and bars are vegetated with understory species and the channel margins support rushes and sedges in some areas.

*Riparian corridor and canopy closure:* These reaches trend toward lower canopy cover with canopy between 50%-75% in Reach 4 and canopy between 0%-25% in Reach 3. The corridor ranges from ~25-50 ft-wide on each bank.

*Listed species with potential to occur:* Steelhead are not known from upstream of Hwy 101, but habitat for spawning and rearing may be present in Reach 4. The crossing at Brooks Rd. appears to be a passage impediment during most flows due to velocity. Both reaches are potential habitat for western pond turtle.



(c) Bottom of Reach 4, looking downstream to Natalie Dr. crossing. Note large bar in the foreground on the left and background on the right. Reach 4 is dominated by numerous areas of bank instability and increasing bar formations (Nov 2008).



(d) Middle of Reach 3, looking downstream. Notice that the banks from the toe to the top are composed of large ungrouted rip-rap. This rip-rap is also found across the channel in many locations and appears to be functioning as grade control, and trapping and retaining sediments (Nov 2008).

## MANAGEMENT CONSIDERATIONS AND OPPORTUNITIES

Management considerations for Reach 4 focus on addressing chronic bank failures, especially the large slip approximately 50 ft downstream from Brooks Rd. Management in Reach 4 should also address the large sediment wedges that have built-up upstream of the Natalie Dr. crossing. This series of bars and wedges extends at least 50 ft upstream from the crossing and is between 1-2 ft above the baseflow water surface elevation. There are also a number of localized sediment wedges in Reach 3 (generally behind rock features) that should be monitored. Based on existing channel capacity, planting to create a canopy in Reach 3 would benefit a wide array of wildlife species and possibly create conditions conducive to supporting steelhead.

# Starr Creek – Reaches 2 & 1

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**JURISDICTION:** Owned in-fee by SCWA

**LOCATION:** Starr 2: Oak Park St. to Windsor River Rd.  
Starr 1: 200 ft west of Railroad Ave. to Oak Park St.

**ADJACENT LAND USE:** Agriculture/grassland and percolation ponds

**UPSTREAM:** Drains RR tracks and residential

**LENGTH:** Starr 2: 1,095 ft.  
Starr 1: 798 ft.

**CHANNEL EASEMENT CORRIDOR WIDTH:**  
Starr 2: 67 ft.  
Starr 1: 76 ft.

**AVERAGE TOP-OF-BANK WIDTH:** Starr 2: 36 ft.  
Starr 1: 54 ft.



(a) Top of Reach 2, looking downstream. The upper section of this reach was mostly dry with a few small pools (foreground) and the margin bars in the active channel (right) are heavily vegetated with blackberry, ox-tongue, and annual grasses. Also, note the low flow channel is cutting through the bars and re-creating some sinuosity (Nov. 2008).

## PHYSICAL CONDITIONS

**Reach setting:** Located in a suburban area west of Hwy 101 in Windsor, Starr Cr. appears to be disconnected from its watershed headwaters by the railroad tracks and Hwy 101, receiving most of its flow from local runoff. Starr Cr. and the larger Windsor Cr watershed are situated in a small valley between the Mayacamas Mtns to the west and the Russian River Valley to the east.

**Active channel:** 10-12 ft wide from toe to toe with low flow channel ~2-4 ft wide; 3-5 ft below banks, flow depths 0"-2' with alternating sections of dry and wet channel in November 2008.

**Bed sediments/texture:** mix of fine sands, clay, and organic muck

**Bank structure:** earth and rock in Reach 2 with rip-rap increasing moving downstream; wide range of slopes from 3:1-1:1, all banks are shallow <5ft high.

**Channel processes:** In-channel deposition occurs throughout Starr Cr. reaches 2 and 1 with bar sequences, wedges, and a small low flow channel "notched" through the sediment deposits. Alternating pattern of scour and deposition observed. Localized bank erosion observed, with abundant riprap used throughout



(b) Reach 1 looking downstream from Oak Park St. crossing. Note that the right bank is completely rocky, Starr 1 contains significant rip-rap at all bends and along most banks. Also notice that the low flow channel is barely visible through the sediment and vegetation (Nov. 2008).

## MAINTENANCE HISTORY

# *Starr Creek – Reaches 2 & 1*

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reach (photo c); large bypass in lower Reach 1 (photo d). Most of Starr 1 and 2 were either dry or had shallow barely flowing water in November 2008. A few isolated pools (2' max depth) were also observed.

*Water quality (qualitative):* poor with greenish water and algae in nearly every small pool.

## **BIOLOGICAL CONDITIONS**

*Instream Habitat:* Aquatic habitat is limited by a lack of surface flow during the summer and fall. The channel does contain some sinuosity with undercut banks, but these features are limited and most of the channel appears to support non-wetland vegetation and there are no large perennial pools for amphibians, reptiles or fish.

*Vegetation composition:* There is a narrow corridor of live oaks along the top of Reach 2 (photo a) and woody vegetation in Reach 1 is mostly limited to occasional willows and alders in the channel and a few oaks along the upper banks. Understory vegetation and in-channel vegetation is dominated by species such as blackberry, doc, grasses, ox-tongue etc. There were no cattails, tules, or sedges.

*Riparian corridor and canopy closure:* Upper Reach 2 supports a dense, but very narrow riparian corridor with canopy closure reaching 75% (photo a) and Reach 1 contains only sparse canopy with closure between 0%-10%. The corridor ranges from ~10- 30 ft wide on either side.

*Listed species with potential to occur:* potential habitat for western pond turtle.



(c) Middle of Starr 1, looking across the channel. Note the rocks on the left and the eroding bank just downstream on the right. This situation is common in Reach 1, where part of a bank had been repaired with rock and the adjacent, downstream bank is now unraveling (Nov 2008).



(d) Bottom of Reach 1 looking downstream at the inlet of a large bypass structure. This structure is located near the bottom of the reach at a big bend. Bypass inlet covers approximately 75 ft of bank conveying high flows into an underground culvert (Nov 2008).

## **MANAGEMENT CONSIDERATIONS AND OPPORTUNITIES**

Assuming the flood bypass channel (photo d) functions as designed, management considerations for Reaches 2 and 1 should focus on ameliorating the bank erosion occurring along many of the non-rocked banks and regular vegetation maintenance to remove blackberries. Sediment accumulation should be monitored throughout the reach. If bypass channel is not working as designed, some sediment management activities may be necessary to increase the conveyance capacity of these channels and reduce the risk of overbank flows. If this is necessary, skimming of the existing bars and wedges should allow the current “notched” low flow channel to remain inset within the cross section. Lower Reach 2 and Reach 1 could also benefit from upper bank planting to increase canopy and retard growth of in-channel vegetation.

# *Starr Creek – Reach Tributary 1*

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**JURISDICTION:** Owned in-fee and maintained by SCWA

**LOCATION:** 300 ft north of Colleen Dr. (photo a) to 275 ft south of Buckingham Dr (photo d).

**ADJACENT LAND USE:** Single family residential

**UPSTREAM:** Non-maintained and undefined channel upstream

**LENGTH:** 1,980 ft

**CHANNEL EASEMENT CORRIDOR WIDTH:** no data

**AVERAGE TOP-OF-BANK WIDTH:** no data



(b) Starr Cr. Tributary looking upstream to blocked culverts at Stellar Lane crossing. Two parallel corrugated pipe culverts are blocked with abundant deposition, both upstream and downstream of the crossing (Jan. 8, 2009).

## **MAINTENANCE HISTORY**



(a) Starr Cr. Tributary looking upstream, from above Colleen Dr.; channel 4-6 ft wide is inset 2-4 ft. below bench of riparian corridor with oaks, alders, and eucalyptus (Jan 8, 2009).

## **PHYSICAL CONDITIONS**

**Reach setting:** Starr Cr. Tributary is a local tributary that drains the northeast section of Windsor, west of the RR; watershed area is small

**Active channel:** in upper reach width ranges between 4-6 ft and 2-4 ft. deep with flow depth up to 2 ft. (photo a); in lower reach active channel widens to 10-15 ft wide at the base of broad trapezoidal channel form, with shallow diffuse flows across bed (photos c/d).

**Bed sediments/texture:** generally silts and sands in the upper reach, with finer sediments and mud collecting downstream of culverts in the lower reach (photos c/d).

**Bank structure:** earthen banks throughout; upper reach has steeper box-shaped low-flow channel inset within channel corridor; lower reach has broader trapezoidal shape with gentle slopes (3:1).

**Water quality:** gentle gradient creates low flowing stream, sections of lower reach have pooled/stagnant flow upstream and downstream of culverts.

**Channel processes:** upper reach has more channelized flow processes which keeps low-flow channel free of depositing sediment; lower reach becomes more depositional as channel form widens, slopes lessen, and culvert crossings provide opportunities for settling.

# Starr Creek – Reach Tributary 1

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## BIOLOGICAL CONDITIONS

*Vegetation composition:* In the upper reach, there is good canopy cover (oak, alder, eucalyptus) and in-channel wetland vegetation of approximately 30%, with blackberry prominent along banks (photo a). Downstream, channel zone becomes more open without canopy cover and grasses, cattails, and other emergent wetland vegetation increase to 90% of the channel area downstream of Stellar Lane. Ruderal grasses dominate the banks in this area (photos c/d).

*Riparian corridor and canopy closure:* Upper reach, mature oak and eucalyptus trees provide approximately 80% cover (photo a). Lower reach, canopy closure decreases to areas of zero cover (photo c), and areas with some cover (photo d).

*Instream habitat:* Upper reach provides shaded stream with stable banks, and clearly defined channel; problem is that the lower reaches have several sediment blockages, and culvert blockages that would effectively limit any instream species migration upstream.

*Listed species with potential to occur:*



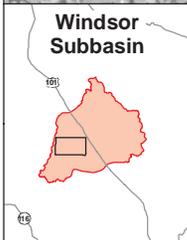
(c) Starr Cr. Tributary looking downstream from Stellar Lane crossing. Presence of cattails, deposited sediment, and some trash and debris downstream of crossing. Riparian canopy of oaks develops further downstream (Jan 8, 2009).



(d) Starr Cr. Tributary looking downstream from Buckingham Dr. crossing. Similar to Stellar Lane crossing, gentle and wide stream cross section collects sediment. Instream emergent marsh vegetation and shallow/diffuse flow conditions (Jan 8, 2009).

## MANAGEMENT CONSIDERATIONS AND OPPORTUNITIES

Management opportunities at Starr Cr. Tributary focus on the removal of sediment at blocked culverts upstream and downstream of the Stellar Lane (photos b/c) and Buckingham Dr. (photo d) crossings. These lower sections of the reach should be evaluated for the potential excavation of a low flow channel, similar to what is observed in the upper reach (photo a), where channelized low-flows pass through a 3-5 ft. wide channel that maintains itself free of being overly depositional. Slopes and gradient in the lower reach may or may not facilitate development of a low flow channel, but the opportunity should be evaluated. Additionally, in the section upstream of Stellar Lane, bank plantings would greatly improve the riparian canopy cover.



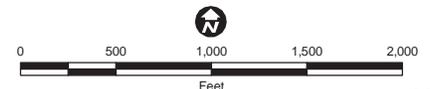
### Vegetation Type

- Blackberry Scrub
- Mixed Riparian Scrub
- Riparian Woodland (full canopy)
- Riparian Woodland (up to 75% canopy)
- Riparian Woodland (up to 25% canopy)
- Riparian Forest
- Ruderal
- Willow Scrub
- Developed

—|—| SMP Maintenance Reaches

Sources:  
Sonoma County Water Agency  
County of Sonoma  
AirPhotoUSA, 2005

**FIGURE 4-3**  
**Reaches and Vegetation**  
**Windsor (2 of 4)**



1 inch equals 1,000 feet

# Windsor Creek – Reach 1

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**JURISDICTION:** Owned in-fee and maintained by SCWA

**LOCATION:** Windsor Rd. to ~2000ft upstream of Pool Cr. confluence (near Starr Rd.)

**ADJACENT LAND USE:** Vineyards and pasture

**UPSTREAM:** Non-SCWA Maintained Reach (~1 mile upstream to Hwy 101)

**LENGTH:** 4,263 ft

**CHANNEL EASEMENT CORRIDOR WIDTH:** 112 ft

**AVERAGE TOP-OF-BANK WIDTH:** 87 ft



(b) Middle of Reach 1 looking downstream. This photo shows the progression of Windsor Creek regaining a natural meander through increasing high sediment deposits on both sides of the channel. Also notice the line of willow (background) along the toe of bank showing the historic channel configuration (Nov 2008).

## MAINTENANCE HISTORY



(a) Near top of reach looking upstream toward Windsor Rd. crossing. Low flow channel meandering through sediment bars of varying sizes on both side of the channel (Nov 2008).

## PHYSICAL CONDITIONS

**Reach setting:** Reach 1 begins at the southwestern boundary of the City of Windsor and flows southwesterly through a gently sloping alluvial valley between Hwy 101 and the Russian River Valley. Approximately 2000 ft downstream from the terminus of Reach 1, Windsor Cr. flows into Pool Cr, a tributary to Mark West Cr.

**Active channel:** ~25 ft wide with a 3-4 ft wide confined low flow channel in most sections; 4-6 ft deep below banks, flow depths between 4"-3' with deep pools.

**Bed sediments/texture:** sand and gravel in the upper sections fining to sand and silt in the lower sections.

**Bank structure:** North bank gently sloped at 3:1-4:1 earthen, south bank steeper at 2:1 in most places, with rip-rap; banks generally shallow ~2ft on north and 4-6 ft high on south.

**Channel processes:** Reach 1 appears to be a major depositional reach, with an array of coarse and fine sediments creating large in-channel bars throughout (photos a, b, and d). Although the active channel is a straightened trapezoid, sediment deposition and scour have re-created a sinuous low flow channel in most locations (photos a and b). Also, the shallow banks on the north side allow for connections between the channel and a small remnant bench-floodplain.

# Windsor Creek – Reach 1

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Water quality (qualitative): clear in November 2008

## BIOLOGICAL CONDITIONS

*Instream Habitat:* Aquatic habitat in Reach 1 is generally of high quality with clear flowing water and many types of instream complexity. The low flow channel is confined and sinuous with well developed pools and riffles as well as gravel bars/beds, undercut banks, and other features adding to complexity. Also, the reach maintains shady conditions in most places with a dense riparian canopy. Conditions are ripe for a wide array of amphibians, reptiles, and fish.

*Vegetation composition:* The reach supports dense stands of woody riparian vegetation along much of both banks with arroyo willow and alders at the margins of the active channel (photo b and c) and a mix of oaks, willows, alders, and other tree species along the low floodplain and banks. Understory is dominated by blackberry and grasses and is generally limited by significant shade. Emergent or margin vegetation is dominated by a variety of shade tolerant herbaceous plants including grasses and sedges. In areas with open canopy (generally lower sections of the reach), cattails form large clumps on shallow bars (photo d).

*Riparian corridor and canopy closure:* This reach supports a dense, narrow riparian corridor with some wider riparian floodplain on the north banks for much of its length. The riparian corridor gets narrower and less dense in the bottom 1/3 of the reach (photo a, b, and c vs photo d). The corridor ranges from ~20-80 ft-wide (north bank wider) with canopy closure ranging from 10% (photo d) to 100% (photo c), with most areas containing between 25-50% closure.

*Listed species with potential to occur:* Steelhead are known from this reach and may rear in some of the deep shaded pools. Potential habitat for western pond turtle and special status plants.



(c) Lower Reach 1, looking downstream at one of the wider channel sections. This section has no sediment wedges and instead of a meandering, confined low flow channel, in this section the channel is wide, shallow, and more ponded (Nov 2008).



(d) Near the bottom of Reach 1, looking across channel. Note low flow channel in foreground and the large wide "floodplain" bench adjacent to the low flow channel. The bench shows signs of recent inundation (photo from November 2008) and supports an array of wetland vegetation including cattails, water plantain, etc. (Nov 2008).

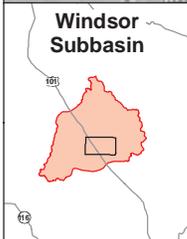
## MANAGEMENT CONSIDERATIONS AND OPPORTUNITIES

Management considerations for Reach 1 are not urgent due to the lack of infrastructure threatened by overtopping creek banks and a quasi functioning mini-floodplain adjacent to the channel in many locations. If conveyance capacity is an issue, some careful bar skimming would be advised. There is an

## *Windsor Creek – Reach 1*

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agricultural crossing about 2/3 of the way down Reach 1 and the sediment bars upstream and downstream of the crossing should be evaluated for their influence. This crossing should be watched and if it is still used, sediment management may be necessary in the coming years. If it is not still used (it does not appear to be used), it should be removed. The riparian canopy thins significantly at the lower portions of this reach and could benefit from some canopy enhancement activities.



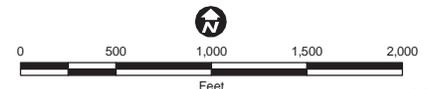
### Vegetation Type

- Blackberry Scrub
- Mixed Riparian Scrub
- Riparian Woodland (full canopy)
- Riparian Woodland (up to 75% canopy)
- Riparian Woodland (up to 25% canopy)
- Riparian Forest
- Ruderal
- Willow Scrub
- Developed

—|— SMP Maintenance Reaches

Sources:  
Sonoma County Water Agency  
County of Sonoma  
AirPhotoUSA, 2005

**FIGURE 4-4**  
**Reaches and Vegetation**  
**Windsor (3 of 4)**



1 inch equals 1,000 feet

# Faught Creek – Reach 1

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**JURISDICTION:** Owned in-fee and maintained by SCWA

**LOCATION:** Old Redwood Hwy. to Amie Dr.

**ADJACENT LAND USE:** Residential

**UPSTREAM:** Ag drainages between Pleasant Ave and Faught Rd

**LENGTH:** 1,494 ft

**CHANNEL EASEMENT CORRIDOR WIDTH:** 115 ft

**AVERAGE TOP-OF-BANK WIDTH:** 92 ft



(b) Looking upstream toward Old Redwood Hwy. Key things to note in photo: (1) the sliver of concrete in upper left is concrete wing wall of bypass culvert (photo a); and (2) channel downstream of bypass culvert is completely dry and appears to be perched about 1.5 ft above the culvert inlet (shunting all flows into the bypass)(Nov. 2008).

## MAINTENANCE HISTORY



(a) Faught Creek from Old Redwood Highway looking downstream into the concrete bypass conduit. Water is flowing in the uppermost section of this reach between the bridge and bypass culvert (photo taken Nov. 2008). This culvert carries flows to its outlet downstream of Reach 1, below Amie Dr.

## PHYSICAL CONDITIONS

**Reach setting:** Faught Cr., located on the alluvial plain below the Mayacamas Mnts, is a small creek draining upstream fields and some small hillside drainages. Aerial photo analysis suggests that Faught Cr might have been an abandoned arm of Pool Cr., a larger system directly to the north. This reach is unique because the majority of all flows bypass (photo a) the channel and flow through an underground conduit,

**Active channel:** 3-4 ft wide, with no flowing water (Nov 2008), one small stagnant pool ~2" deep.

**Bed sediments/texture:** mix of gravel, coarse sand, and organic material.

**Bank structure:** mix of rip-rap overlain by soil and earth w/o rip-rap.

**Channel processes:** Channel dynamics in Faught Cr are especially interesting since the majority of low flows and high flows bypass the channel and are carried downstream by a 36" culvert (photo a and photo d). Flows from the bypass re-enter the channel downstream of SCWA ownership. The channel, although dry, maintains some natural heterogeneity with eroding outer bend, building point bars (photo c), and relic pool/riffle sequences.

**Water quality (qualitative):** dry through most of the reach.

# Faught Creek – Reach 1

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## BIOLOGICAL CONDITIONS

*Instream habitat:* Aquatic habitat in Faught Cr Reach 1 is severely limited by lack of surface water. Due to the fact that all low flows (baseflows) bypass the channel through an underground culvert, there is no perennial or intermittent aquatic habitat currently. The channel does, however, contain topography indicative of relic pool/riffle sequences and contains other elements of complexity including undercut banks, eroding outer meander bends, and developing point bars (photo c).

*Vegetation composition:* This reach supports dense, narrow stands of woody riparian vegetation dominated by valley oaks and live oaks with ash and other woody trees interspersed. The understory is dominated by blackberry, German ivy, poison ivy, and periwinkle.

*Riparian corridor and canopy closure:* This reach supports a dense, narrow riparian corridor ranging from 50- 75ft-wide on each bank with canopy closure ranging from 75%-100%.

*Listed species with potential to occur:* potential habitat for western pond turtle.



(c) Middle of Faught Creek Reach 1 looking downstream, channel bottom is covered with leaves with no apparent surface flow. The outside bank at this bend appears to be eroding and portions of the channel are aggrading and other portions are incising (Nov 2008).



(d) Middle of Reach 1, cross-section showing both the manhole for the bypass conduit and the narrow, but dense valley oak riparian corridor along the stream channel (Nov 2008).

## MANAGEMENT CONSIDERATIONS AND OPPORTUNITIES

The current bypass inlet at Faught Creek Reach 1 appears to be not only conveying high flows, but conveying all low flows. Management should focus on determining (via as-builts) whether the current condition reflects the intent of the design. If this design was intended to bypass high flows only, then the inlet area and adjacent channel may need to be reworked to re-perennialize the channel. There does appear to be a sediment wedge or earthen berm across the channel about 10 ft downstream of the inlet. This blockage might be responsible for diverting low flows into the inlet and may allow for a simple fix. Regardless of the original intent of the designs, re-routing low flows through the natural channel would result in creating better riparian and instream habitat for an array of species and does not appear to be problematic from a flood control perspective.



### Vegetation Type

- Blackberry Scrub
- Mixed Riparian Scrub
- Riparian Woodland (full canopy)
- Riparian Woodland (up to 75% canopy)
- Riparian Woodland (up to 25% canopy)
- Riparian Forest
- Ruderal
- Willow Scrub
- Developed

||| SMP Maintenance Reaches

Sources:  
Sonoma County Water Agency  
County of Sonoma  
AirPhotoUSA, 2005

**FIGURE 4-5**  
**Reaches and Vegetation**  
**Windsor (4 of 4)**



1 inch equals 1,000 feet

# Airport Creek – Reaches 2 & 1

**JURISDICTION:** Easement and maintained by SCWA

**LOCATION:** Airport 2: from Skylane Blvd. downstream approx. 300 ft.  
Airport 1: from railroad tracks to Skylane Blvd.

**ADJACENT LAND USE:** Industrial

**UPSTREAM:** Localized drainage from developed flats (no clear sign of a channel)

**LENGTH:** Airport 2: 2,157 ft. (but SCWA maintenance easement only on upper 300 ft. of Reach 2)  
Airport 1: 300 ft

**CHANNEL EASEMENT CORRIDOR WIDTH:**  
Airport 2: 89 ft  
Airport 1: 71 ft

**AVERAGE TOP-OF-BANK WIDTH:**  
Airport 2: 73 ft  
Airport 1: 66 ft



(b) Near the top of the reach looking downstream. Notice the engineered trapezoidal channel configuration and abundance of cattails growing across the flat channel bottom. Although this reach has very little riparian growth, plant poplars and oaks as well as willows appear to be thriving along a small section of creek (see photo c) (May 13, 2008).

## MAINTENANCE HISTORY



(a) Upper Reach 2 looking upstream to concrete apron that marks the beginning of SCWA's easement. Area upstream of apron channel appears more like a shallow swale across the lower plain. Broad and wide channel. Note recently cut cattails in the channel re-growing and entering culvert in the lower right (May 13, 2008).

## PHYSICAL CONDITIONS

**Reach setting:** Reaches 1 and 2 of Airport Creek appear to receive much of their flow from a mix of runoff from residential, industrial, and agricultural lands along the flat alluvial plain. The channel upstream of the engineered easement appears to originate west of Highway 101 as a swale across flat pasture. Downstream of the railroad tracks, the channel is fed by numerous storm drains from adjacent industrial complexes.

**Active channel:** 15-20 ft wide, water depths 0-6 in.

**Bed sediments/texture:** fine materials such as silt and mud line the channel bottom

**Bank/bed structure:** straight, trapezoidal engineered channel with earthen banks and some concrete at the upstream end of Reach 2 (photo a); bank slopes are not too steep 2:1 (photo b); channel cross section appears to become more shallow in the downstream direction toward Skylane Boulevard with increased sediment deposition across the channel in the lower reach.

**Water quality:** while no obvious impairments to water quality were observed, the majority of flow appears to be runoff from industrial complexes, which may result in impaired water

# Airport Creek – Reaches 2 & 1

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quality; little active flow and shallow conditions could exacerbate these conditions.

*Channel processes:* This reach has clearly aggraded since it was built, and the Skylane culvert functions effectively as a hydraulic

constraint, slowing flows and fostering deposition. There are no observable sediment bars; instead the sediment appears to be building from the culvert upstream.

## BIOLOGICAL CONDITIONS

*Vegetation composition:* Ruderal grassland along most of the creek; in the middle part of Reach 2, some riparian woodland has developed due to willow growth along the channel margins and a variety of past plantings. Cattails fill the entire channel bottom.

*Riparian corridor and canopy closure:* Lack of tree growth leads to almost no canopy along the channel, except for the patch of willow creating approximately 25% closure for about 200 ft in the middle of Reach 2.

*Instream habitat:* The channel is straight and uniform with no pools, no shade and no deep water. This channel is likely dry or nearly dry during the summer/fall. It is bounded by the railroad tracks to the east and industrial development to the north and south. Although habitat conditions for fish, amphibians and reptiles are currently poor, wildlife could use this channel as a corridor between the pasture upstream and downstream habitats.

*Listed species with potential to occur:* Both reaches are potential habitat for western pond turtle; California tiger salamander are unlikely to occur in the upland habitat of either reach. Airport 2 is potential habitat for listed plant species.



(c) Middle of the reach, looking upstream. Although woody riparian species are limited throughout much of this reach, a 200+ft section in the middle of Reach 2 contains a dense patch of willows near the toe of slope and planted oaks and poplars at top of bank (May 13, 2008).



(d) Looking downstream at the culvert under Skylane Blvd. This aluminum arch is heavily impacted (as of 11/07) by sediment and cattail growth. It looks as though the culvert has lost at least ¾ of its capacity and the road bed is within a few feet of the top of the culvert. There is also a large sediment wedge on the downstream side of the culvert (May 13, 2008).

## MANAGEMENT CONSIDERATIONS AND OPPORTUNITIES

Management considerations for Airport Creek Reaches 1 and 2 focus on vegetation removal throughout the reach and sediment removal near the Skylane Blvd culvert crossing. Due to lack of sinuosity, complexity, and shade, a number of treatments could be used to improve habitat conditions and reduce in-channel emergent vegetation growth. Aggressive planting with riparian species to provide shade and habitat would help control cattail growth and increase the value of these reaches as a migration corridor.