

East Santa Clara Waterway

Enhancement and Maintenance Strategy Report



July 2019

Acknowledgements

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Cover Photo: East Santa Clara Waterway near Lenox Road.

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Section 1: Background and Purpose

1.1 Introduction

The East Santa Clara Waterway (ESCW) is a small tributary stream of the Willamette River, located on the northern edge of the Eugene metropolitan area. The waterway is approximately 2.5 miles in total length and flows northerly through a mix of urban, suburban, and agricultural lands before flowing into the Willamette River.

A defined 3/4-mile section of the ESCW, approximately between Division Avenue and just east of Lenox Road/Salty Way, has been the subject of recent interest by some adjoining property owners, primarily about the perceived risk of flooding. This segment of waterway receives stormwater runoff from rooftops, sidewalks, driveways, roadways, and other impervious surfaces from about 421 acres of residential and commercial lands north and south of Beltline Highway, and east and west of River Road. The waterway itself runs almost entirely through privately-owned properties, approximately half of which are within the Eugene city limits and half of which are within Lane County jurisdiction (see Figure 6: ESCW Hydrology Map). Public drainage easements exist over most, but not all, of its length. Due to the challenging physical and jurisdictional characteristics of this waterway, the City and County have partnered to conduct a comprehensive examination of the issues and opportunities, and proposed actions to address them. Since many of the same issues and opportunities exist on other waterways, the examination process and results may be transferrable to other locations throughout the Eugene metropolitan area, particularly in north Eugene.

1.2 Purpose and Use of the Enhancement and Maintenance Strategy Report

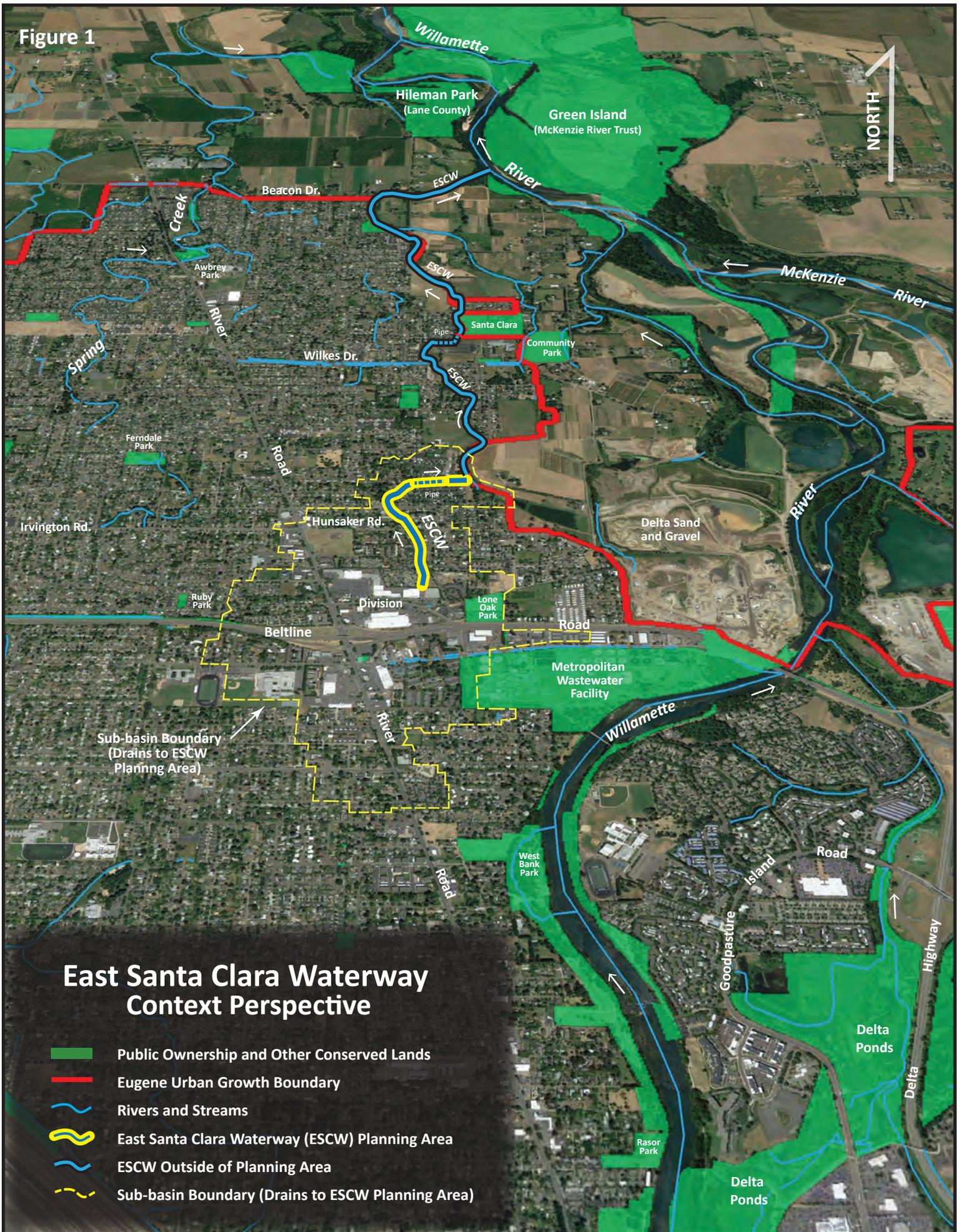
The purpose of this report is to document the comprehensive examination of issues and opportunities conducted on a defined section of the East Santa Clara Waterway and the strategy, in the form of a set of actions, identified to address them. This report is to be used as guidance for the implementation of the strategy and as a template for use in evaluating other similar waterway segments.

1.3 Geographic Setting and Context

The ESCW was historically part of a complex network of backwater sloughs and oxbow channels associated with the frequently shifting Willamette River channel and is still situated within the Federal Emergency Management Agency (FEMA)-mapped 100-year floodplain associated with the river.

The focus area for this planning effort includes a defined segment of the ESCW that has a highly urbanized catchment area totaling 421 acres (see Figure 1: ESCW Context Perspective). The open waterway originates at an outfall from the piped stormwater system just to the north of Division Avenue and flows northward and then eastward for approximately 3,600 linear feet where it intersects with the urban growth boundary (UGB) and flows into a remnant river oxbow. Through the planning area, the ESCW is primarily an open channel, but it does pass through several short-culverted segments along the way. Once leaving the planning area, the ESCW continues northward and eventually flows into the Willamette River approximately two miles to the north.

Figure 1



East Santa Clara Waterway Context Perspective

- Public Ownership and Other Conserved Lands
- Eugene Urban Growth Boundary
- Rivers and Streams
- East Santa Clara Waterway (ESCW) Planning Area
- ESCW Outside of Planning Area
- Sub-basin Boundary (Drains to ESCW Planning Area)

1.4 Overview of Planning Process

This *Enhancement and Maintenance Strategy Report* was developed under the direction of a multi-disciplinary team of City of Eugene and Lane County staff who met monthly between May 2018 and January 2019. These meetings addressed topics including research needs, identification of issues and opportunities, development of an outreach strategy, formulation of management and maintenance goals, and evaluation of potential actions.

1.4.1 Project Tasks

The work that was conducted to develop the proposed strategies summarized in this document included the following major tasks:

1. Compile known, existing information
2. Identify additional research needs
3. From #1 and #2, identify initial set of known problems and opportunities associated with the waterway with respect to flood control, water quality, natural resources, and public awareness
4. Reach out to property and business owners to obtain their impressions and perspectives
5. Refine set of problems and opportunities based on property owner input
6. Identify overarching maintenance and management goals for the waterway, consistent with adopted policies
7. Develop potential actions to address problems and opportunities
8. Evaluate potential actions and select proposed actions
9. Produce draft report to summarize process and proposed actions
10. Obtain feedback from property owners on the set of proposed actions
11. Finalize document
12. Implement actions, track progress, and keep property owners apprised

1.4.2 Property and Business Owner Outreach

During the initial project team meetings, it was agreed that working with property and business owners directly to help identify and solve problems along this section of waterway was essential. These community members understood the site context and the evolving and historical conditions that have been observed over the years, even if that data was merely memory.

To gather the necessary data and help tell a better story about the conditions, the project team created a presentation using the Adobe product *Spark*. The visual, shareable story lived on a webpage and showcased the problems along the entire stretch of waterway.

Instead of sharing this presentation to homeowners during an open house style meeting, a City and County team went door-to-door to homes along the waterway over a two-day period. This team stopped at every house that was located adjacent to the ESCW within the planning area and talked with people who were home at the time about the project, the issues, and how we could all come together to develop a solution. If residents weren't home, team members left a door hanger with information on how to find the web page and survey.

Most of the people who responded to the survey appreciated that the City and County were working together to find a viable solution for waterway maintenance and management. Survey responses varied, specifically when trying to describe how the problem was created and the best way to manage the stream moving forward. A total of 20 individual responses were received and are compiled in Appendix C.

In general, many of the residents said they would be willing to share in the maintenance of the waterway, if the City/County could first come together and regrade and clear the creek of fallen trees and overgrown vegetation, to allow water to better flow from south to north. From there, homeowners said they would reassume maintenance, however it's likely that education for people living along here and other waterways will have to be a long-term component.

A draft of this report was uploaded to the City's web site in mid-May and the ESCW neighbors were notified so they had a chance to review the content and recommendations prior to a scheduled June neighborhood meeting. On June 3, City staff distributed door hangers throughout the neighborhood announcing a "neighborhood conversation" scheduled for June 11. This gathering was generously hosted at a neighbor's home and attended by City and County staff and approximately a dozen neighbors and focused on presentation of report findings and recommendations along with discussion of priorities, timing, and next steps. Summary notes from this meeting are included in Appendix E.

1.5 Maintenance and Management Goals

A total of three maintenance and management goals were developed to guide the planning process for the ESCW. The goals were informed by adopted policies applicable to the City of Eugene and Lane County and refined for the particular set of issues and opportunities represented by this particular waterway. These goal, along with associated issues, opportunities, and recommendations are included in Figure 9.

Maintenance and Management Goals for the East Santa Clara Waterway

Goal 1: Conveyance.

Maintain the flood control and drainage functions of the ESCW to protect life and property.

Goal 2: Water Quality and Habitat.

Maintain and improve water quality in the ESCW to provide safe and healthy environment for humans, plants, and wildlife.

Goal 3: Property Owner Outreach and Engagement.

Promote and support neighborhood stewardship of the ESCW and ensure that adjacent property owners are aware of their regulatory requirements and responsibilities.

Section 2: Historical Condition and Maintenance Activities

2.1 Historical Condition (pre-settlement)

The General Land Office (GLO) survey notes of the 1850s provide the best available record of the pre-settlement vegetation patterns in the Willamette Valley. The federal government commissioned these surveys to record general vegetation communities and other significant features present at the time. These maps were translated into digital map format in the 1990s. At the time of the Willamette Valley GLO surveys, the native plant communities were presumably grazed to some extent by free-ranging livestock brought in by early settlers, but otherwise largely undisturbed through other Euro-American activities such as road building, drainage, tilling, or urban development (Christy et al. 2011).

The GLO map data indicates the area that is today the ESCW, was covered with a hardwood riparian forest at the time of the 1850s survey. This was a component of much broader riparian forest that bordered the Willamette River and its floodplain. The riparian forest was approximately two miles in width in this area at and the main channel of the Willamette River is shown to be located in a broad meander that brought it nearly a half mile further to the west of its current location (almost to the present day ESCW). A remnant of that meander remains today, located just below the planning area. Other nearby vegetation present in the 1850s included large expanses of upland prairie with smaller patches of oak savanna and conifer forest (see Figure 2: Historical Vegetation Map).

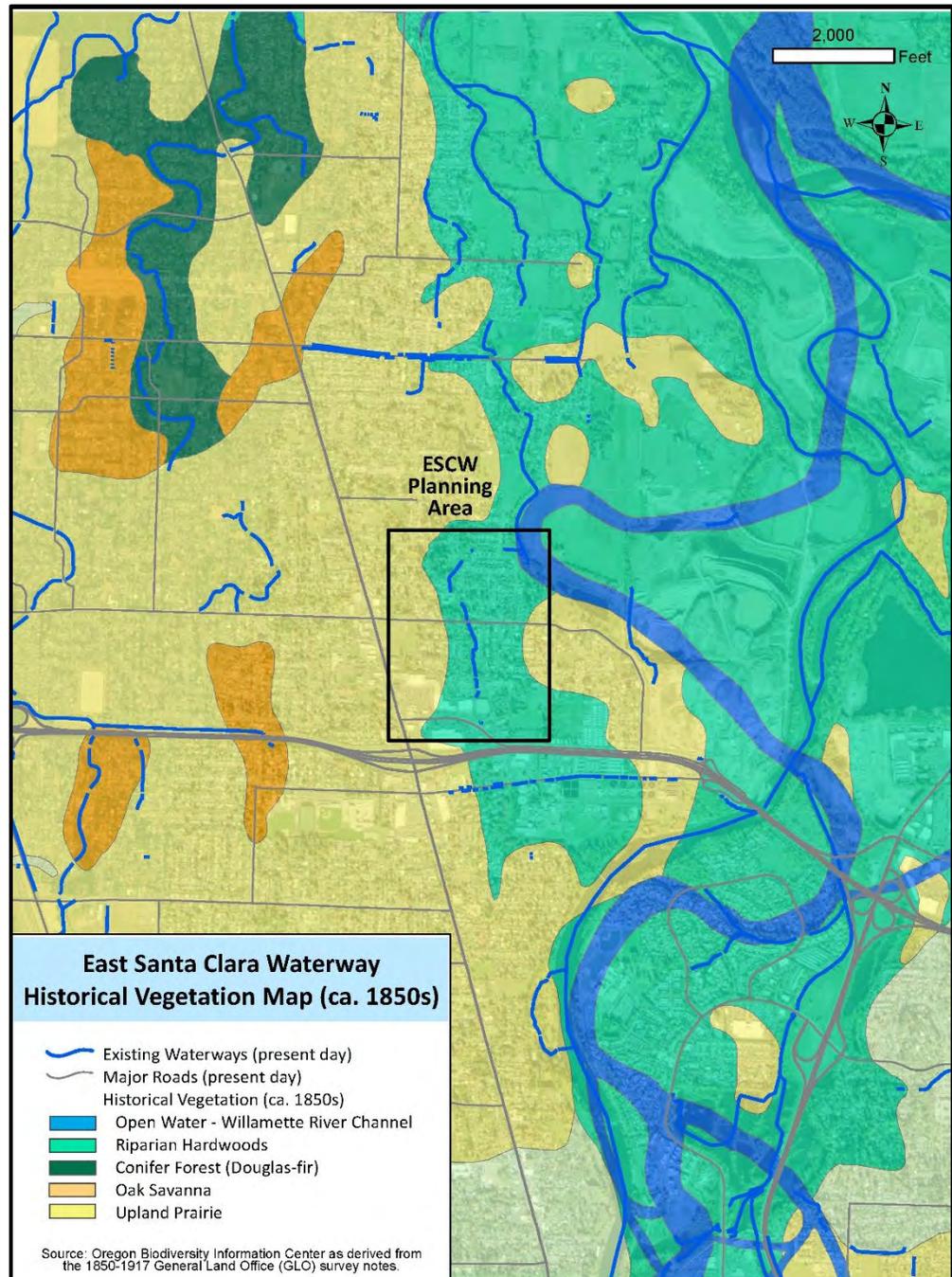


Figure 2: Historical Vegetation Map

2.2 Land Use History

Historical aerial photos are useful for documenting development patterns and changes in vegetation communities over time. In our region, the first comprehensive aerial photo flight occurred in 1936 (see image below). A summary of observations from each of the eight historical photos (1936, 1942, 1952, 1960, 1968, 1977, 1986, 1994, and 2004) collected for the ESCW is listed below. The full sequence of historical aerial photos can be found Appendix A. These aerial photos document gradual transition from an agricultural dominated landscape in the 1930s to a more urbanized setting with a mix of residential and commercial uses and the associated network of paved roadways.

1936 Aerial Photo (see Figure 3)

- Area is dominated by agricultural uses including hayfields and extensive orchards
- Very minimal riparian vegetation lining the ESCW
- River Road, Lone Oak Avenue, Hunsaker Lane, and River Avenue are all present (River Road appears to be the only paved road in the area)
- Willamette River has shifted eastward from the position shown in the 1850 GLO surveys.

1942 Aerial Photo

- Very little land use change
- Riparian vegetation along ESCW is maturing

1952 Aerial Photo

- Residential subdivisions are appearing along River Road
- Little change to lands adjacent to the ESCW

1968 Aerial Photo (see Figure 4)

- Beltline Road has been constructed
- Susan Street and Summer Street residential subdivisions have been built
- Salty Way residential subdivision is under construction

1977 Aerial Photo

- Portion of current Salty Way residential subdivision is complete
- Beltline Road ramp added
- Big box commercial constructed near Beltline Road
- Site preparation for additional big box commercial underway

1986 Aerial Photo

- Big-box commercial construction completed at south end of ESCW

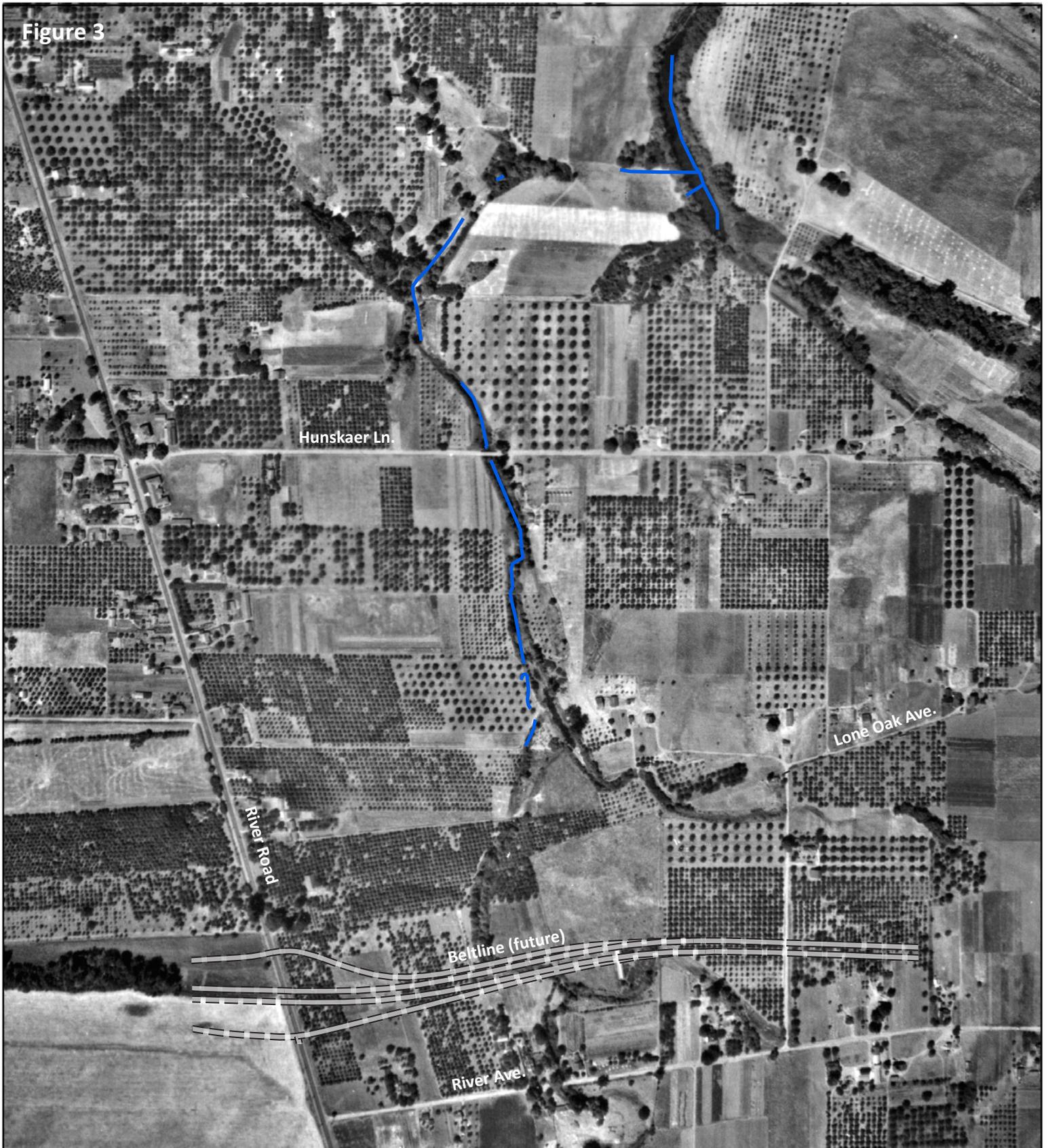
2004 Aerial Photo

- North end of Salty Lane residential subdivision complete
- Mimi Street/Lone Oak Way residential subdivision constructed
- Lone Oak Assisted Living Center constructed

2017 Aerial Photo (see Figure 5)

- Miles Way/Lazy Lane/Silver Meadow Drive residential subdivision constructed at north end of ESCW

Figure 3



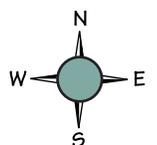
East Santa Clara Waterway 1936 Aerial Photo

Note: Blue line indicates the current location of the ESCW;
Dashed line indicates future location of Beltline Road

0 400 800 feet



Scale



Source: University of Oregon Map and Aerial Photo Library
Map prepared by Jeff Krueger

2.3 Recent Capital Projects and Public Maintenance (County and City)

The entirety of the ESCW contained within the planning area is located on privately owned land with the exception of road crossings where the waterway passes through the public right of way in culverts. The properties are approximately half City and half County jurisdiction and public drainage easements of varying types and widths exist on most, but not all, of the properties. Past City and County maintenance activities in this area have been minimal. City and County maintenance and management activities that have occurred over the past decade are listed below:



Storm event photo-point located on the ESCW at the culvert under Lone Oak Way

- **Storm Event Photo-point Monitoring:** There were six occurrences of “Storm Event Photo-point Monitoring” relevant to the ESCW in the past 10 years. Twice in 2010, twice in 2012, and once each in 2014 and 2015. The City documents how the stormwater drainage system is functioning partly through the use of photo-points, of which 21 are located city-wide and are monitored during significant rain events. During those six monitoring events since 2008, City staff noted no obstructions or unexpectedly high flow volumes at the ESCW monitoring point at Lone Oak Way.
- **Vegetation Maintenance:** City staff conducted manual vegetation cutting in the waterway, south of Hunsaker for a distance of approximately 400 feet upstream, in June 2016. This was done in response to neighbor concerns about slow drainage of the waterway. The vegetation clearing did not appear to significantly improve drainage.
- **Pipe Cleaning and Culvert Replacement:** A stormwater capital improvement project was constructed by the City in 2015 at the south end of the ESCW planning area where the waterway emerges from the piped system. The project included cleaning out sediment that had built up in the piped system, replacing an existing 36-inch outfall pipe with a 60-inch pipe, and installing a new in-line stormwater pollution control manhole.
- **Culvert Cleaning:** The twin 48-inch culverts located at Hunsaker Drive were cleaned by County staff four times over the past decade.

Section 3: Physical Conditions

3.1 Topography and Soils

The ESCW is located in the relatively flat valley bottom which consists of alluvium made up of loam and gravels deposited by the Willamette River over the millenniums. Within the planning area, the ESCW flows at a very shallow gradient, starting from approximately 388 feet in elevation above sea level at the upper end of the planning area, dropping to 378 feet at the downstream end of the planning area. This 10-foot drop over 3,600 feet translates to an average gradient of only about 0.25 percent. The NRCS Soil Survey of Lane County classifies the ESCW and adjacent land as Chehalis Silty Clay Loam. This is a deep, well-drained soil associated with floodplains with moderate permeability. This soil type is not considered a hydric or wetland type due to its permeability.

3.2 Surface Hydrology and Floodplain

The ESCW receives the majority its flow from a piped stormwater system which drains rooftops, sidewalks, driveways, roadways, and other impervious surfaces from residential and commercial properties and associated roadways north and south of Beltline Highway, and east and west of River Road. The total catchment for ESCW planning area (within the UGB) is approximately 421 acres as shown on the Context Perspective (Figure 1: ESCW Context Perspective). In addition to surface runoff, a privately-owned system of three sump pumps located in the basement of a nearby commercial building discharge a significant amount of groundwater into the piped system upstream of the ESCW throughout the year. The sump pumps have a total discharge capacity of 5 million gallons per day (MGD), although it appears that typically only one pump is operational at a time, with a capacity of 2 MGD. The flow from this private system enters the ESCW via the publicly owned piped system at the upper end of the waterway. It has been observed by City staff that one or more of the sump pumps run almost continually through the wetter months and intermittently as the water table drops during dryer periods. It can be assumed that the waterway would likely be dry during the late summer months without inflow from the sump pumps. Summertime flow currently tends to pool in the area south of Hunsaker Drive, slowly percolating into the ground.

The entire length of the ESCW and the lands immediately adjacent to the channel are located within the mapped 100-year floodplain (see Figure 6: East Santa Clara Waterway Hydrology map). The 100-year floodplain is an area mapped by the Federal Emergency Management Agency (FEMA) that would be inundated by flooding having a 1-percent chance of occurring in a given year. Major flooding has not been recorded in this area in recent decades and this has been confirmed through the land owner outreach effort.

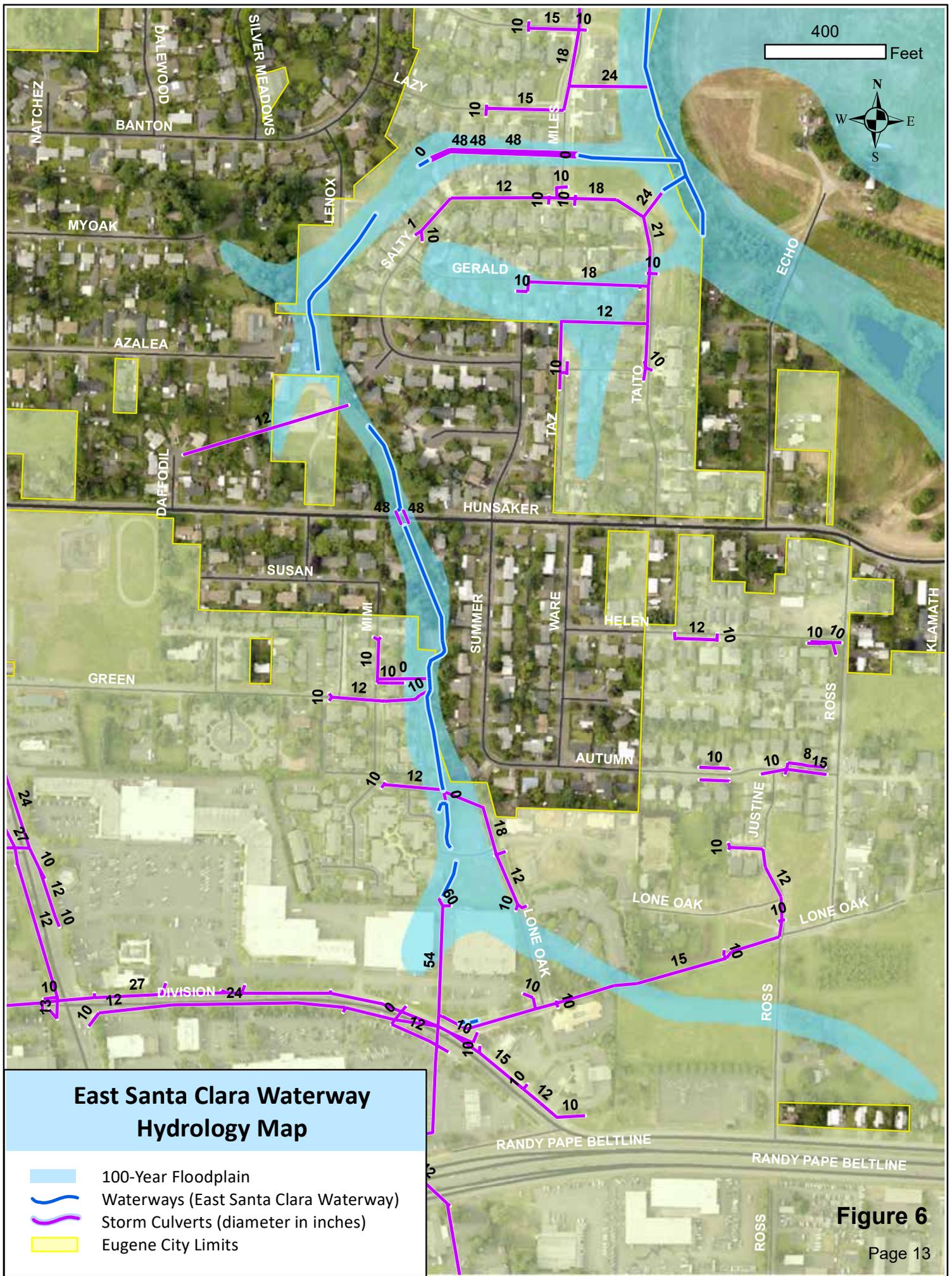
3.3 Groundwater

Groundwater levels are known to fluctuate throughout the year as a function of seasonal rainfall. In the Eugene area, the highest water levels typically occur in the February through May time period. During this timeframe, the average depth to groundwater in the River Road-Santa Clara area is about eight feet below ground surface. It is reasonable to assume that groundwater levels influence the ESCW in several ways: potentially contributing to standing water during the wetter times of the year, necessitating continuous pumping of the basement sump pumps discussed in Section 3.2 of this report, and affecting the degree to which water percolates into the ground. A discussion with Oregon Water Resources Department staff in the investigative phase of this project confirmed these general assumptions. Additional monitoring could clarify the degree to which groundwater levels influence the volumes of water and functionality of the ESCW.

3.4 System Capacity and Conveyance

The major stormwater system (the system of larger connected pipes and open waterways) in the River Road-Santa Clara area, including the ESCW, was modeled in conjunction with updating the 2012 [River Road – Santa Clara Stormwater Basin Plan](#) to identify any predicted flooding problem areas. Stormwater system improvements in the City and County are designed to meet conveyance design criteria based upon the size of the drainage area and the type of system (closed pipe or open channel). Where the design criteria are not met, capital projects are identified and added to the longer list of project needs city-wide. Through the Capital Improvement Program (CIP) development for both City and County, projects are prioritized, and the highest priority projects are implemented within the budget limitations of the respective CIPs. The design criteria for the ESCW is a 10-year storm (one having a 10% chance of occurring in any given year). A 10-year storm on the ESCW segment of interest is estimated to result in a peak flowrate of 64 to 84 cubic feet per second, at the upstream and downstream locations, respectively (equivalent to about 41 and 54 MGD, respectively). These modeling results are estimates based on best available information. One caveat to the estimates is that actual flow data was not available to use for model calibration. The modeling identified predicted flooding problems, and capital projects are listed in the adopted Basin Plan to address them. One of the projects has been completed, located at the south end of the ESCW planning area, as indicated in Section 2.3 of this report: City replaced an existing 36-inch outfall pipe with a 60-inch pipe, and installed new stormwater pollution control manhole.

In addition to the modeling work that was done, some constraints to channel capacity and other observations have been noted by City and County staff on recent site visits and through research. Constraints include some non-permitted dumping of soil and yard debris in the channel as well as the construction of retaining walls, fences, and a bridge within the FEMA-designated 100-year floodplain. Several trees planted in the bottom of the channel have potential to cause conveyance issues as well in the future when they mature. Field observations also confirm that the inverts (elevation at the bottom of the pipes) on the double culverts under Hunsaker Drive are above the flow line of the channel, thus water backs up behind the culverts to some degree before it flows under the road and downstream. Field observations also confirm what modeling concluded in that the channel lacks positive grade, from upstream to downstream (See ESCW Channel Profile in Appendix D). Sub-surface conditions also appear to cause more infiltration than expected, in that the downstream end of the ESCW of interest is relatively dry and receives through-flow intermittently. Three 48-inch culverts at the downstream end do not appear to see much flow at all. More investigation is needed to confirm potential flooding problems before proceeding with additional capital projects.



East Santa Clara Waterway Hydrology Map

- 100-Year Floodplain
- Waterways (East Santa Clara Waterway)
- Storm Culverts (diameter in inches)
- Eugene City Limits

Figure 6

3.5 Vegetation

Vegetation along the ESCW is highly variable depending largely on property owner maintenance practices (see cross-sections in Figure 7, next page). Portions of the channel are lined with significant riparian trees and shrubs, casting shade on the waterway. Other segments are maintained as regularly mowed lawns and lack riparian shade. Blackberry thickets line the channel in some areas, making access and observation of the channel difficult.

3.6 Water Quality

The City's stormwater monitoring program includes physical, chemical and biological monitoring at various locations around the City, however there is no known sampling data specifically associated with the ESCW. Since much of the inflow to the waterway comes from rooftops, sidewalks, driveways, roadways and other impervious surfaces within the 421-acre urbanized drainage area, it can be assumed that typical urban pollutants may be found in the ESCW. Typical urban stormwater runoff may contain sediment, nitrogen, phosphorus, bacteria, and other pathogens, hydrocarbons, heavy metals and organics. To reduce those pollutants to the maximum extent practicable, the City and County implement best management practices (BMPs) including source controls, stormwater outreach and education, street sweeping, catch

basin cleaning, capital improvement projects, illicit discharge detection and elimination, spill response, erosion prevention for construction sites, tree planting, and coordinating volunteer restoration activities. The City and Lane County partner on several of these stormwater BMPs through intergovernmental agreements. In addition, the lack of vegetation along some segments of the waterway represents an opportunity to further enhance riparian area trees and shrubs to shade the waterway and cool downstream water temperatures.



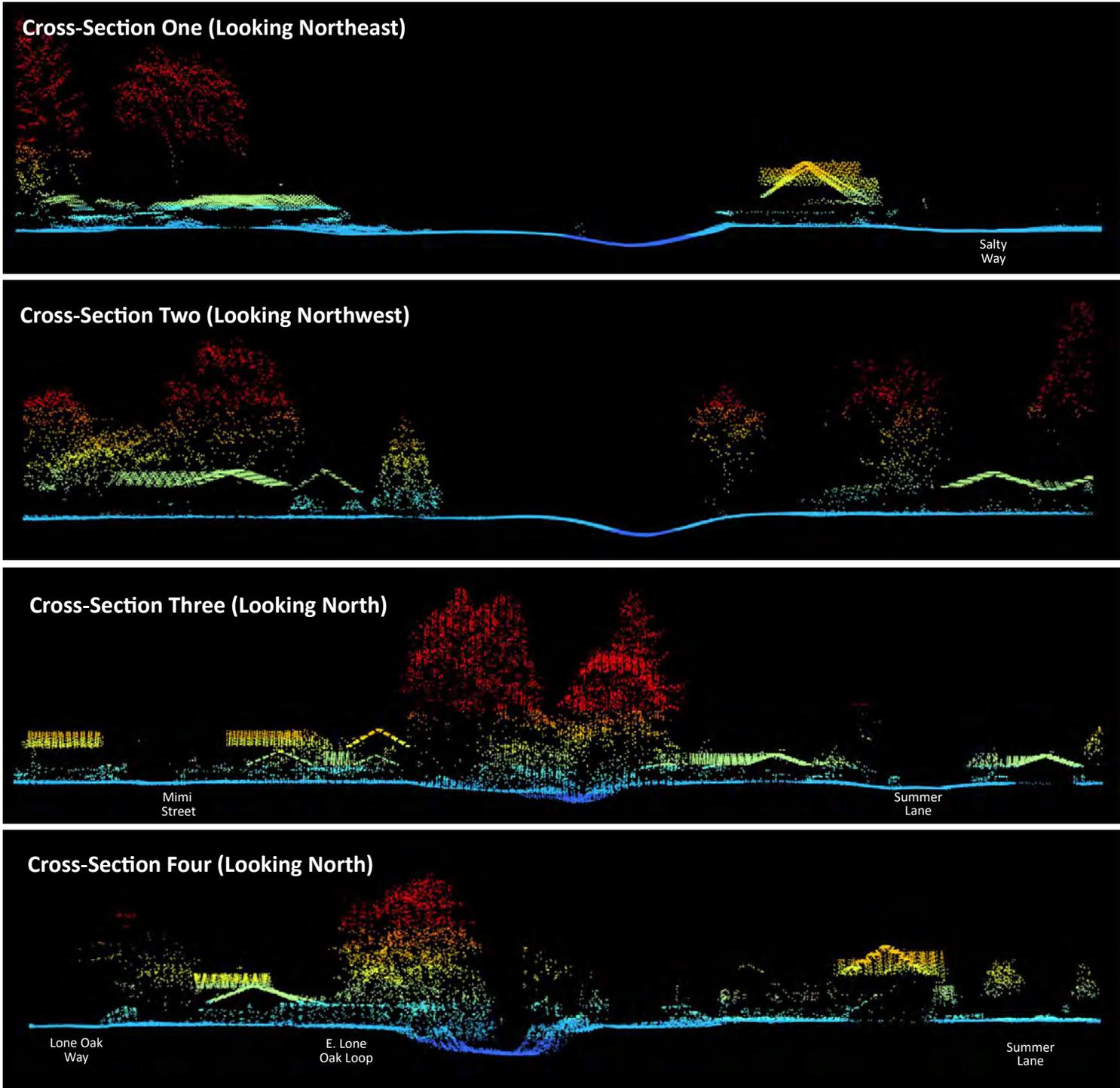
ESCW looking southwest near Salty Way



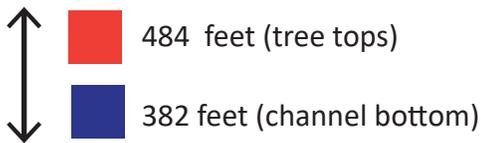
ESCW looking south from Hunsaker Lane

3.7 Existing Ownership and Land Uses

Once largely an agricultural landscape, land uses adjacent to the ESCW today are almost exclusively low-density residential development and associated roadways (see Figure 6: Hydrology Map). The last few vacant residential lots along the channel located on Taito Street are currently under development. Several commercial buildings with large parking areas and associated roadways are located just above the ESCW and much of the runoff originating from these areas flows into the waterway via the piped system.



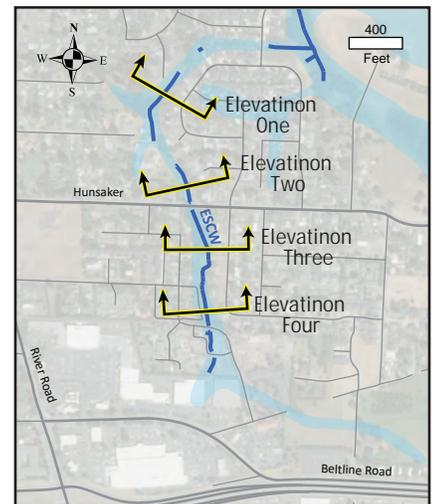
Elevation Range



Source: Oregon Department of Geology and Mineral Industries LiDAR topographic data (2018), prepared by Jeff Krueger.

July 2018

Figure 7
East Santa Clara Waterway Cross-Sections



Section 4: Related Plans, Policies, and Regulation

4.1 Related Plans and Policy Direction for the East Santa Clara Waterway

Stormwater program policy for the City of Eugene is documented in the 1993 [Comprehensive Stormwater Management Plan](#) (CSWMP). The River Road – Santa Clara Basin Plan, previously referenced in Section 3.3, brought CSWMP into tighter focus for this area and describes how the broad policies are to be implemented in River Road- Santa Clara, given its unique characteristics. The Basin Plan includes context for city-wide stormwater development standards, a list of predicted conveyance issues on the major stormwater system, and a set of capital projects to address those issues. The Plan was adopted by both the City of Eugene and Lane County in 2012.

4.2 Regulatory Requirements Applicable to the East Santa Clara Waterway

In addition to locally-adopted policies and plans, federal, state, and local regulations inform public agency and private property owner actions in order to protect properties from flooding, protect and improve water quality in our creeks and rivers, and protect and restore habitat along waterways in Eugene. This section describes briefly the regulations that most directly pertain to the ESCW and lands immediately adjacent to it.

4.2.1 Flood Protection and Conveyance

One important aspect of protecting life and property from flood and drainage hazards is maintaining the capacity of the public stormwater conveyance system. The public stormwater conveyance system is a series of pipes, ditches, and waterways that convey stormwater runoff to a receiving waterbody. The ESCW receives runoff from a piped system that outfalls just north of Division Avenue and is itself a part of the public stormwater system. The City of Eugene and Lane County have adopted flood control design criteria for the public system (as well as privately owned and managed on-site stormwater systems). Design criteria vary depending upon the type of system component (pipe or open channel) and size of catchment area draining to it. The ESCW, an open waterway serving an area of 421 acres, is required to convey the “10-year design storm”, equivalent to a storm event of a magnitude that has a 10% chance of occurring in any given year. Actions such as filling a waterway with soil, dumping yard debris, or otherwise reducing the area within a waterway are discouraged, and in some instances prohibited, by Eugene and Lane Code. These actions restrict the system’s ability to convey stormwater runoff and can lead to flooding.

Another important aspect of flood protection is proper management of the FEMA-designated 100-year floodplain. The City and County each participate in the federal National Flood Insurance Program (NFIP) program which is essentially an agreement between local communities and the federal government such that if a community adopts and enforces floodplain management regulations to reduce future flood risks to new construction in a designated floodplain, the federal government will make flood insurance available within the community as a financial protection against flood losses. The City and County also participate in the FEMA Community Rating System (CRS). The CRS is a voluntary program that recognizes and rewards communities for taking proactive steps to reduce the potential impacts of flooding and enables the community to earn insurance premium reductions. Floodplain management requirements within the 100-year floodplain, adopted into Eugene Code and Lane County Code, are designed to prevent new development from increasing the flood threat and to protect new and existing buildings from anticipated flood events. The NFIP and CRS programs result in a safer community, and help minimize property damage, build resiliency, and foster a better quality of life.

4.2.2 Water Quality & Habitat

The federal Clean Water Act and Safe Drinking Water Act regulate the quality of stormwater discharged to surface water and groundwater, respectively. The City and County hold separate permits under these federal programs which require each agency to implement best management practices that reduce stormwater pollution. In Oregon, the permits are administered by the Department of Environmental Quality. Eugene and Lane County take multiple direct actions to reduce stormwater pollution including street sweeping, catch basin cleaning, illicit discharge detection and elimination, water quality capital projects, and stormwater education. The agencies also take indirect action by regulating certain private development activities. In the Eugene city limits, stormwater development standards apply to all new development and re-development that would add or replace 1,000 square feet or more of impervious area. Within the entire Eugene urban growth boundary (UGB), erosion prevention regulations apply to all construction activities that will cause land disturbance or otherwise negatively impact stormwater quality.

The Clean Water Act also includes requirements to protect wetlands. In Oregon, the Oregon Division of State Lands and the U.S. Army Corps of Engineers work together to implement federal and state wetland protection regulations. If a person proposes to remove, fill, or alter more than 50 cubic yards of material within “waters of the State” (which would include the ESCW), they must obtain a permit from the Division of State Lands and/or U.S. Army Corps of Engineers.

Oregon’s statewide land use planning Goal 5 is aimed at protecting natural resources including fish and wildlife habitat. Regulatory setbacks and prohibitions on filling and piping of certain wetlands and waterways, in the form of the locally-adopted Water Resources (/WR) Overlay Zone, apply to the most downstream portion of the ESCW planning area, approximately where the waterway intersects with the UGB east of Miles Way. At that location, the regulated setback area measures 20 feet landward from the top of bank.

4.3 Drainage Easements

Most of the ESCW planning area is located within public drainage easements or designated “conservation zones.” In many cases the easements were established with the plat or subdivision and were recorded from the 1960s to the early 2000s. Easement widths vary along the length of the waterway. The language among easements varies, but most convey to the City (or unnamed public entity) the rights to access for purposes of maintaining the conveyance of the channel. In some cases, the easement specifically authorizes the construction, maintenance, operation, inspection, and improvement of the channel for flood, drainage and irrigation canal purposes. Most of these easements specifically prohibit the placement of a permanent building in the easement area. See Appendix B: Drainage Easement Maps for maps that illustrate the extent of existing easements.

4.4 Local Land Use & Zoning Regulations

The ESCW planning area is situated entirely within Eugene’s UGB, but the area contains a complex mix of annexed parcels and non-annexed parcels. Parcels outside of city limits must comply with Lane County Code until they re-develop or otherwise trigger annexation, at which time the parcel would come under City jurisdiction and Eugene Code. The lots that border the ESCW are almost exclusively zoned for Low-Density Residential with Community Commercial and Medium-Density Residential zoning in the area to the south and west of the planning area along Division Avenue. The majority of lots that are within proximity to the ESCW have been developed to what their current zoning allows.

Section 5: Issues and Opportunities

The following issues and opportunities related to the ESCW have been identified and mapped (see Figure 8: ESCW Infrastructure, Issues, and Opportunities Map) by the project team and neighboring property owners and are sorted under the general categories of Flood Protection and Conveyance, Water Quality and Habitat, and Property Owners Outreach and Engagement:

5.1 Flood Protection and Conveyance

- Minor development issues within the floodplain that could impact channel capacity such as constructed walls, fences, and bridges or dumping of yard debris or soil.
- An undersized 18" culvert was installed by adjacent land owner in the area to the north of Hunsaker Drive.
- Nearby sump pumps in a commercial building are pushing significant amounts of water into the upper end of the ESCW throughout the year, likely contributing to standing water to the south of Hunsaker Drive.
- Lack of positive grade on the 3/4-mile waterway segment, significant flow input originating from the sump pumps (third bullet above), City's 2015 pipe cleaning and culvert replacement project, in-stream constraints, and culvert inverts that are set too high (e.g. Hunsaker) all potentially contribute to capacity issues in a large rain event and localized ponding of water upstream of Hunsaker.
- Several trees and shrubs have been planted in the bottom of the main channel and could cause future conveyance issues.
- Lack of clarity and consistency between City of Eugene, Lane County, and homeowners regarding responsibilities for maintenance of the waterway.
- Invasive and woody vegetation (e.g., blackberry) growing in the channel bottom contributes to conveyance issues and may accommodate illegal camping.
- Maintenance easements are not in place along some parcels along waterways which hampers ability to address waterway issues with continuity (2 parcels along ESCW currently lack easements).
- Homeowners north of Hunsaker are concerned that, as conveyance issues are addressed south of Hunsaker, the same issues will migrate downstream.

5.2 Water Quality and Habitat

- Segments of the waterway currently lack vegetation and habitat features that are beneficial to water quality (shading) and wildlife habitat and some neighbors have expressed interest in the topic
- Homeowners have limited knowledge of pollutant issues and best management practices for properties along a waterway (e.g. limiting use of pesticides and fertilizers)

5.3 Property Owners Outreach and Engagement

- Many community members and neighbors do not think of ESCW as a stream or a natural feature.
- Many neighbors have a limited knowledge or understanding of regulatory and land use obligations of living along a waterway and floodplain.
- Information about responsibilities, requirements, vegetation mgt. techniques, etc. is difficult for homeowners to access.

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General Issues:

- Lack of clarity and consistency between City of Eugene, Lane County, and homeowners regarding responsibilities for maintenance of existing waterway.
- Limited homeowner knowledge of regulatory responsibilities, existing easements, potential flooding risks, and land use permitting requirements (sheds, fences, fill, pumps, etc.).

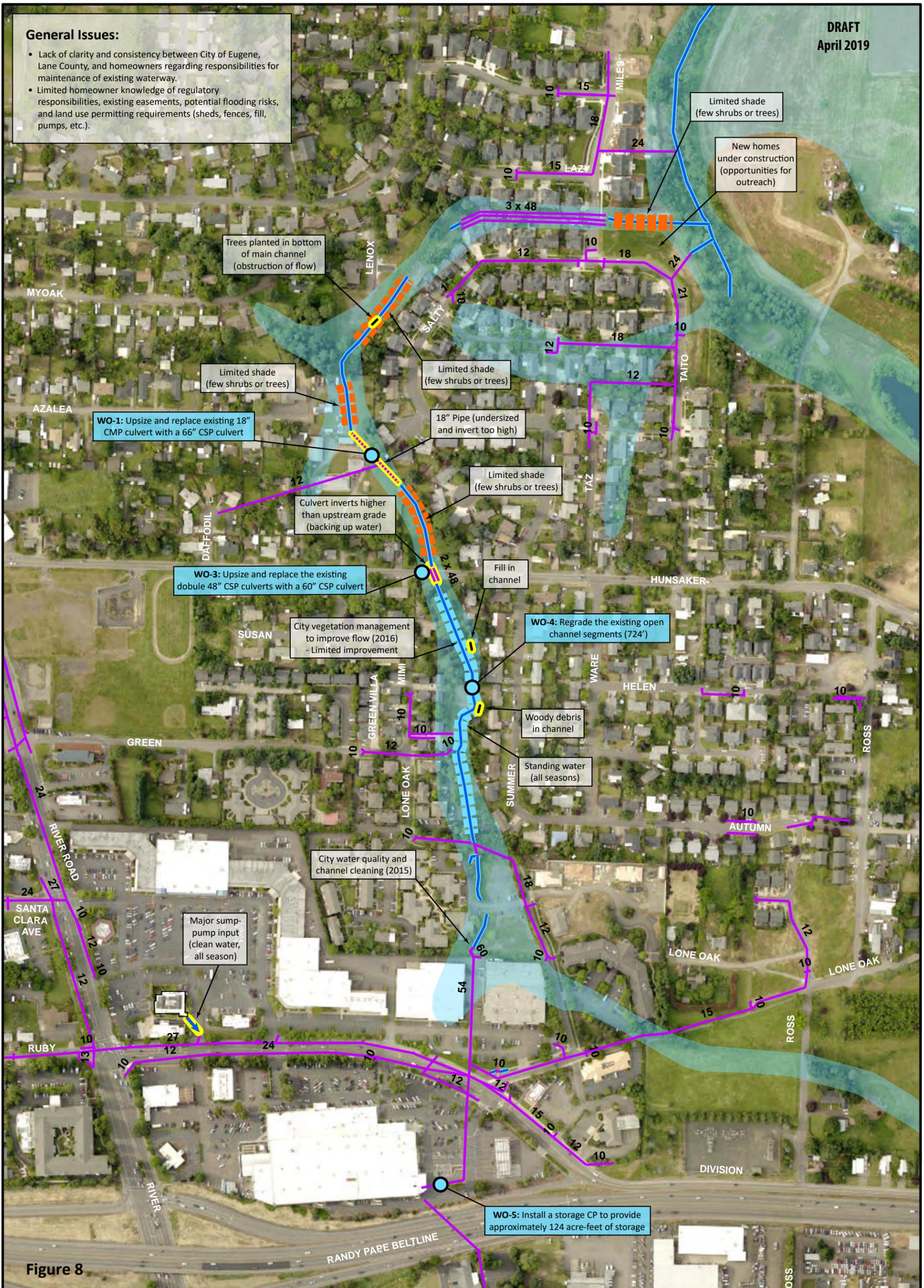


Figure 8

**East Santa Clara Waterway
Infrastructure, Issues, and Opportunities Map**

300 feet



Legend

- 100-Year Floodplain
- Waterways (East Santa Clara Waterway)
- Stormwater Culverts (size in inches)
- Proposed Floodwater Capital Projects*
- Standing Water (all year)
- Lack of Shade (limited tree cover)
- Other Issues Identified

*Projects proposed in 2010 Stormwater Basin Master Plan

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Section 6: Goals and Recommended Actions

Figure 9: Goals and Recommended Actions Table

Estimated Cost Key: \$ = Low cost (achievable within current budgets or programs); \$\$ = Moderate cost (under \$100,000); \$\$\$ = High Cost (over \$100,000, would need major funding independent of current budgets)

Implementation Timeline Key: Short-range = 1 to 2 years; Mid-range = 3 to 5 years; Long-range = Greater than 5 years

Issue or Opportunity (identified for ESCW)	Proposed Actions	ESCW-Specific	System-Wide	Lead for Implementation	Considerations
Goal 1: Conveyance. Maintain the flood control and drainage functions of the ESCW to protect life and property.					
1. Minor development issues within the floodplain that could impact channel capacity such as constructed walls, fences, and bridges or dumping of yard debris or soil.	a. Educate property owners about the function of the floodplain and encourage voluntary participation in removing these impedances.	Short-range (\$)	Mid-range (\$)	City floodplain admin; LC Land Management	<ul style="list-style-type: none"> Preferred approach
	b. Educate property owners about the function of the floodplain and require them to remove these impedances.	If needed (\$)	If needed (\$)	City floodplain admin; LC Land Management	<ul style="list-style-type: none"> Progressive, after (a)
	c. Begin enforcement actions for building in floodplain to protect life and property.	If needed (\$\$)	If needed (\$\$)	City BPS Code Enforcement; LC Land Management	<ul style="list-style-type: none"> Progressive, after (a) & (b) Would need to first determine whether enforcement authority exists for each individual situation.
	d. Increase channel inspection of ESCW to be more proactive related to dumping and non-permitted uses (e.g., 3- to 5-year inspection cycle starting on ESCW in 2019 as pilot project). Consider applying system-wide based on results of pilot).	Short-range (\$)	Mid-range (\$\$) based on evaluation of pilot	City Public Works POS; LC Public Works	<ul style="list-style-type: none"> Given that public easements are in place over most of the waterway and public funds would be invested in capital projects, it would be responsible to monitor its condition May lead to follow up actions (i.e., inspection is not an isolated activity) Inspections would be preceded by an information campaign
	e. City and County partner on floodplain-related messaging and communication tools, to improve clarity and consistency of content.	Short-range (\$)	Mid-range (\$)	City Admin & PWE; LC Land Management	<ul style="list-style-type: none"> Greater efficiency and effectiveness in partnering on messaging to residents and the community
	f. Review City and County floodplain development codes for inconsistencies or gaps, within and between the two codes, in non-permitted activities.	NA	Mid-range (\$)	City Development Review Team; LC Land Management	<ul style="list-style-type: none"> To be done in conjunction with City's future CRS rating review
2. An undersized 18" culvert was installed by adjacent land owner in the area to the north of Hunsaker Drive.	a. Proposed Capital Stormwater Master Plan, 2010, Project WO-1 : Upsize and replace the existing 18" culvert with approximately 250 ft. of 66" culvert.	Mid-range (\$\$\$)	NA	City PWE	<ul style="list-style-type: none"> Project in adopted SW master plan, based on modeling of the system under existing and future build-out scenarios
	b. Remove existing culvert; replace with a combination of a larger (66") culvert on the north end and restored open channel configuration on the south end.	Mid-range (\$\$-\$\$\$)	NA	City PWE	<ul style="list-style-type: none"> Lower cost than (a) Minimize impact to existing properties to the east
	c. No action (not recommended)	Short-range \$0	NA	NA	<ul style="list-style-type: none"> Flooding risk, as the basin develops (increased runoff) and as upstream constraints are addressed. Liability for property owner with the undersized culvert.

Issue or Opportunity (identified for ESCW)	Proposed Actions	ESCW-Specific	System-Wide	Lead for Implementation	Considerations
3. Nearby sump pumps in a commercial building are pushing significant amounts of water into the upper end of the ESCW throughout the year, likely contributing to standing water to the south of Hunsaker Drive.	a. Quantify and document the amount of water being pumped and discharged to the ESCWW. Confirm that the limitations on the volume of pumped water discharged to the stormwater system are appropriate and are factored into the operation of the pumps.	Short-range (\$) Underway	NA	City PW Maintenance	
	b. Encourage building owner to determine if sump pump setting could be modified to reduce volume of water pumped, especially during the dry season.	Short-range (\$) Underway	NA	City PW Maintenance for coordination; property owner for implementation	<ul style="list-style-type: none"> • Could reduce electricity cost for property owner
	c. No action (if it is determined that pumping is within range specified by building permit) – allow pump to continue to operate as it currently does and continue to monitor flow as needed (not recommended).	Ongoing (\$)	NA	City PW Maintenance (monitor flow)	<ul style="list-style-type: none"> • Would not help address the issue of standing water
4. Lack of positive grade on the ¼-mile waterway segment, significant flow input originating from the sump pumps (#3 above), City’s tip-up retrofit project, in-stream constraints, and culvert inverts that are set too high (e.g. Hunsaker), all potentially contribute to potential capacity issues in a large rain event, and localized ponding of water upstream of Hunsaker.	a. Conduct an updated conveyance analysis of the waterway segment, quantifying peak flow volumes including from the sump pumps and runoff generated by the catchment area for a 10-year reoccurrence interval storm event. Use results to refine capacity-related actions.	Short-range (\$\$) Underway	NA	City PW Engineering and LC Transportation (proportionally as relates to County roadway catchment)	
	b. Proposed Capital Stormwater Master Plan, 2010, Project WO-4 : Regrade the existing open channel segment to improve drainage.	Mid-range (\$\$)	NA	City PW Engineering as identified in Master Plan	<ul style="list-style-type: none"> • Should be implemented in conjunction with culvert project (WO-3)
	c. Proposed Capital Stormwater Master Plan, 2010, Project WO-3 ; Upsize existing culverts with a larger culvert to provide capacity needed. Set new culvert at a lower grade to allow better drainage.	Long-range (\$\$)	NA	City PW Engineering as identified in Master Plan; LC Transportation (proportionally as it relates to County roadway catchment area)	<ul style="list-style-type: none"> • Should be implemented in conjunction with grading project (WO-4) • Consider using a box culvert
	d. Beaver-Hunsaker Corridor Plan Implementation: Hunsaker Lane is proposed for reconstruction to add sidewalks and bike lanes which will include new stormwater management facilities; the culvert crossing could be set and sized appropriately at that time.	Long-range (\$\$)	NA	City PWE and LC Transportation	<ul style="list-style-type: none"> • LC Transportation has design funding programmed for 2021 • Efficiencies gained if combined with road project
	e. Explore potential options for a short-term solution to the standing water issue south of Hunsaker, pending a longer-term solution once the Hunsaker-Beaver project is constructed.	Short-range (\$\$)	NA	City PWE and LC Transportation	<ul style="list-style-type: none"> • Could include temporary diversion of the dry season sump pump flow to another nearby piped system if feasible.
5. Several trees and shrubs have been planted in the bottom of the main channel and could cause future conveyance issues.	a. Evaluate individual trees to determine if they pose a significant risk to conveyance and leave in place if they do not. Prune or remove as needed to maintain conveyance.	Short-range (\$) Pilot	Long-range (\$\$) Based on pilot	Eugene PW Maintenance	<ul style="list-style-type: none"> • Inspections could be done on all similar waterways in the future (based on evaluation of ESCW pilot)
6. Lack of clarity and consistency between City of Eugene, Lane County, and homeowners regarding responsibilities for maintenance of the waterway.	a. Clarify agency responsibilities specific to ESCW with an IGA and do the same system-wide based on evaluation of ESCW pilot.	Short-range (\$) Pilot	Mid-range (\$\$) Based on pilot	Lane County and City of Eugene Public Works representatives	<ul style="list-style-type: none"> • Include in Management Plan • ESCW could be model for other waterways, but many waterways would be unique
7. Invasive and woody vegetation (e.g., blackberry) growing in the channel bottom cause conveyance issues and may accommodate illegal camping	a. Provide outreach and instructional materials to encourage invasive species control by private land owners.	Short-range (\$) Pilot	Mid-range (\$)	City PWM and LC	<ul style="list-style-type: none"> • Could potentially utilized existing materials
	b. Schedule maintenance under Eugene POS “green piping” program to have City staff clear vegetation as necessary on ESCW as a pilot program.	Short-range (\$) Pilot	Mid-range (\$\$) Consider based on ESCW Pilot	City of Eugene POS	<ul style="list-style-type: none"> • Would need supplemental funding if implemented system wide

Issue or Opportunity (identified for ESCW)	Proposed Actions	ESCW-Specific	System-Wide	Lead for Implementation	Considerations
8. Maintenance easement are not in place along some parcels along waterways which hampers ability to address waterway issues with continuity (2 parcels along ESCW currently lack easements)	a. Keep as is (don't establish formal easements) and try to work with property owners to address issues voluntarily.	Short-range (\$)	NA	Eugene PWE or Lane County depending on location	
	b. Pursue a public storm drainage easement on the two properties along ESCW where they are lacking.	Short-range (\$\$)	NA	Eugene PWE or Lane County depending on location	
	c. Review all waterway segments located on private lands to determine status of maintenance easements and make recommendations for obtaining necessary easements.	NA	Long-range (\$\$)	Eugene PWE or Lane County depending on location	
Goal 2: Water Quality and Habitat. Maintain and improve water quality in the ESCW to provide safe and healthy environment for humans, plants, and wildlife.					
1. Segments of the waterway currently lack vegetation and habitat features that are beneficial to water quality (shading) and wildlife habitat and some neighbors have expressed interest in the topic	a. Provide technical assistance and resources to interested land owners. Create and distribute a "how to" manual for neighbors to understand "right plant, right place"; Include a list of recommended plantings; Include an example of a planting schedule and planting plan.	Mid-range (\$)	Mid-range (\$)	City of Eugene Natural Areas volunteer coordinator; Watershed Councils; Eugene PWE	<ul style="list-style-type: none"> • Successes would help more property owners to become informed stewards • Could utilize or modify existing materials
	b. Seek grant or other funding for restoring native habitat (i.e. native plantings, re-grading, etc.).	NA	Mid-range (\$\$)	City of Eugene POS; Watershed Councils	<ul style="list-style-type: none"> • Limited feasibility for ESCW
2. Homeowners have limited knowledge of pollutant issues and best management practices for properties along a waterway (e.g. limiting use of pesticides and fertilizers)	a. Provide informational materials on stormwater BMPs for streamside properties.	Short-range (\$)	Mid-range (\$)	City of Eugene PWE; Watershed Councils	<ul style="list-style-type: none"> • Could utilize or modify existing materials
Goal 3: Property Owner Outreach and Engagement. Promote neighborhood stewardship of the ESCW and ensure that adjacent property owners are aware of their regulatory requirements and responsibilities.					
1. Many community members and neighbors do not think of ESCW as a stream or a natural feature.	a. Install interpretive signs at the most public portion of the site to highlight the importance of the floodplain and water quality.	NA	Long-range (\$\$)	Eugene POS and PWE; Watershed Councils	<ul style="list-style-type: none"> • Interpretive signage probably not necessary at ESCW, but could be done on other waterways with higher visibility or in proximity to schools or activity centers
	b. Install "East Santa Clara Waterway" signs at the 3 road crossings (such as has been done along Amazon Creek) to promote awareness of this natural feature: @ Lone Oak, Hunsaker, and Salty Way.	Short-range (\$)	Mid-range (\$)	Eugene POS; Lane County Sign Shop	<ul style="list-style-type: none"> • Could be done at other named waterways in addition to ESCW • Could be done as part of the Beaver/Hunsaker project.
2. Many neighbors have a limited knowledge or understanding of regulatory and land use obligations of living along a waterway and floodplain.	a. See proposed actions under Goals 1 and 2.	-	-	-	
3. Information about responsibilities, requirements, vegetation mgt. techniques, etc. is difficult for homeowners to access	a. Add relevant information on County and City web sites.	NA	Short-range (\$)	Eugene PWE, LCPW	<ul style="list-style-type: none"> • Could be compiled on a web page: "What you Need to Know About Living Along a Waterway"

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Appendices

Appendix A:

Historical Aerial Photos (full set)

Appendix B:

Drainage Easement Maps

Appendix C:

Summary of Survey Results

Appendix D:

ESCW Channel Profile

Appendix E:

Summary of June 2019 Community Meeting

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