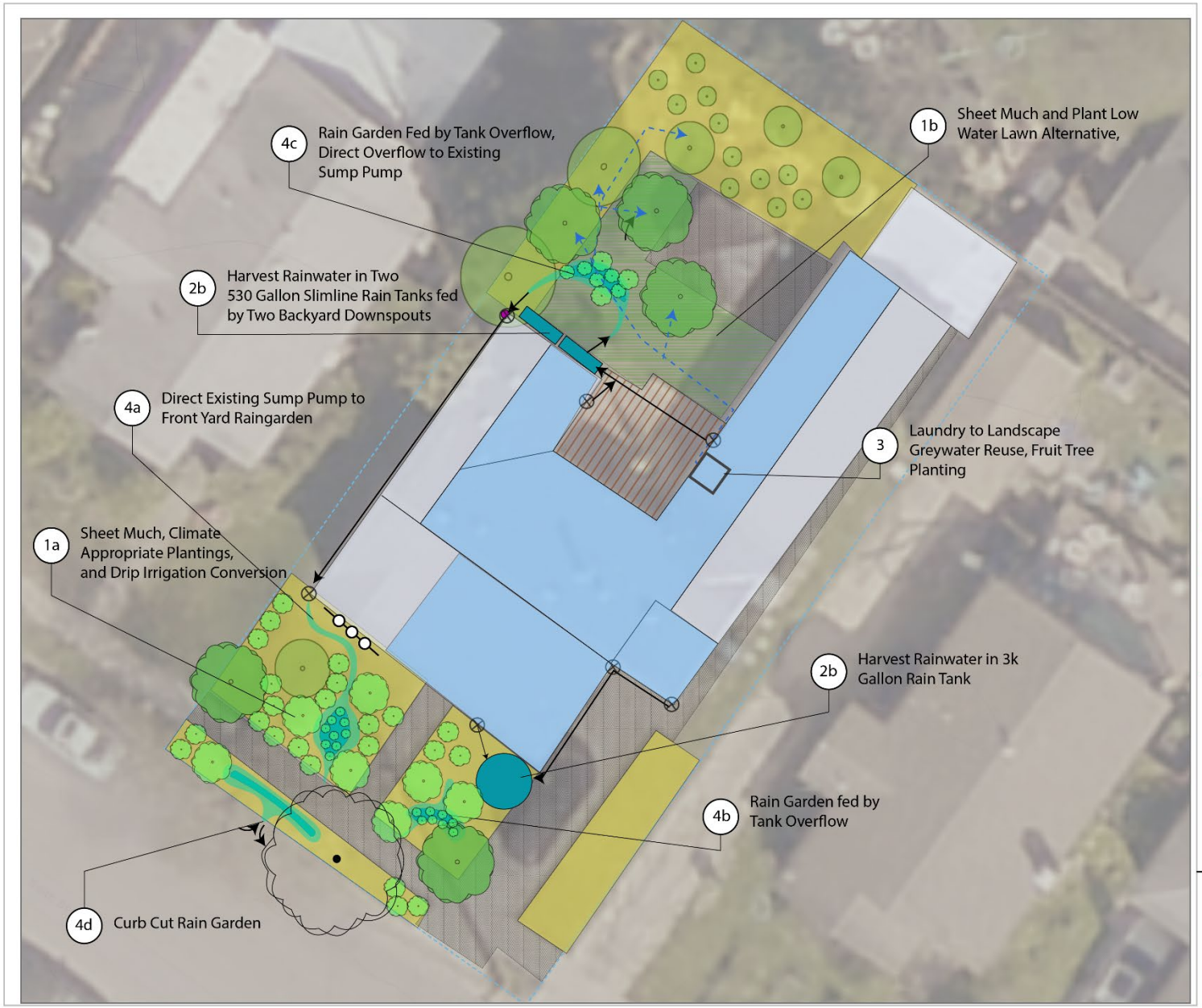
Petaluma River Watershed Land Resilience Partnership
Catalog of Projects

The Land Resilience Partnership (LRP) is assisting Petaluma residents to build neighborhood climate and drought resilience through the design and/or installation support of water-saving landscape projects. Once installed, these projects will provide many benefits for the city and beyond including water use reduction, fire resilience, flood mitigation, carbon sequestration, and the creation of habitat and shade for our community.

This program is funded through a grant from the California Department of Water Resources, and implemented by Petaluma-based nonprofit Daily Acts with technical support from Watershed Progressive. Through 2025, Daily Acts will complete 125 Site Assessments to help Petaluma residents identify water-saving projects they could install to increase their long term resilience to climate impacts like drought, fire, and flood.

As the recipient of a Site Assessment, below you will find your "Catalog of Projects", a design map identifying a number of potential projects that could be implemented at your site. You will also find a summary report of the highest priority projects you could choose to implement for the greatest impact on your water savings. Finally, you will find a table of water savings for your proposed projects.



Legend

(E)=Existing

- (E) Structures
- (E) Hardscape
- (E) Downspouts
- (E) Deck
- (E) Trees
- (E) Sump Pump
- Sheet Mulch and Climate Appropriate / Pollinator Plantings
- Low Water Use Lawn
- Greywater Reuse
- Rainwater Catchment & Overflow
- Slimline Rainwater Catchment & Overflow
- Rainwater Catchment Area
- Rain Garden and Bioswales
- Shade Tree
- Fruit Tree
- Shrub
- Irrigation Retrofit

N
W
E
S

BASEMAP

Not for Construction

LAND RESILIENCE PARTNERSHIP

Daily Acts

DAILYACTS.ORG

201 1ST STREET STE 100
PETALUMA, CA 94952

(707) 780-9664

Summary of Catalog of Projects

The landscape is a typical home in Midtown Petaluma, featuring a grassy front and backyard with a few fruit trees and perimeter perennial plantings. The landscape has the potential to expand its plantings of fruit trees and native plants while reducing its water use by harvesting rainwater and reusing laundry greywater. This Catalog of Projects suggests various resilience building opportunities with the highest priority based upon water conservation and property resilience benefits. The following is a description of the various suggested projects for the site based on our site assessment. More information about designing and implementing the suggested projects can be found in the attached "design templates."

Priority 1 - Sheet Mulching, Climate Appropriate Planting, and Drip Irrigation: The 800 square foot front yard and 450 square foot back yard lawns respectively use 20,500 and 10,200 gallons per year, totalling 30,700 gallons of irrigation per year while providing little to no ecosystem benefits. Sheet mulching is a lawn conversion technique that composts lawn and weeds in place, while building optimal soil for plantings. Climate appropriate plants are native to Mediterranean climates and therefore are adapted to drought conditions. Lawn sprinklers can be converted to drip irrigation to provide supplemental water during establishment. The irrigation demand of newly installed drought tolerant pollinator plantings and drip irrigation in the front is about 2,675 gallons per year in the front and 1,160 gallons per year in the back, totalling 3,835 gallons per year. Lawn conversion has the potential to decrease total outdoor water use by 88%. Irrigation demand will decrease substantially following plant establishment, typically 3-5 years after installation.

By planting drought tolerant groundcovers, a low-water use lawn can be installed in the back to maintain the function of the existing lawn. Drought tolerant groundcovers that withstand foot traffic often used in place of conventional grasses include: Dwarf Pink Yarrow, Dwarf Carpet of Stars, Dwarf White Clover, Wooly Yarrow, Fleur de Lawn, Red Fescue, Meadow Sedge, and Creeping Thyme.

By planting native climate appropriate plants, habitat for local and migratory birds and beneficial insects are supported while enhancing beauty. Additionally, water retention in soil is greatly increased through mulching; up to 30% of more stormwater can be held through the application of 4-6" of mulch on the landscape. Enhanced water retention and decreased erosion from the mulch layer builds soil health and increases the soil carbon sponge.

Fire-wise design can be integrated in sheet mulching and planting for potential fire resiliency and compliance with fire insurances. Decomposing wood chips are the best soft-scape material for fire resilience due to increased soil moisture. While all plants and combustible material should be kept 5 feet from home and fences, fire resistant plants outside this buffer may enhance resilience. Fire resilient plants, such as ceanothus, yarrow, silktassel, toyon, monkeyflower, coffeeberry, and lemonade berry can slow fire spread with their moist tissue layer, providing thermal insulation from fire. Refer to Sonoma Ecology Center's Fire Resilient Landscaping guide for more information: https://sonomaecologycenter.org/creating-fire-resilient-landscaping/.

Refer to the *Mulching* and *Climate Appropriate Planting Design Templates* for more information.

Priority 2 - Rainwater Harvesting: Rainwater storage tanks capture rainwater from rooftops for irrigation or other non-potable uses like animal water, toilet flushing, car washing, etc. Tanks are sited on a level pad and collect water that drains from downspouts directly. Water can be conveyed via buried pipe if tanks are located away from a downspout. Multiple adjacent tanks can be interconnected, or "daisy-chained," so they fill as an interconnected system. All tanks must have a planned overflow route.

The COP recommends multiple opportunities for harvesting and storing rainwater:

- 2a: One 3,000 gallon tank can be placed near the house in the front yard to harvest rainwater that drains from the three identified downspouts, two of which currently contribute to flooding near the garage. The roof area that drains to these three downspouts, or catchment area, drains 7,400 gallons of rainwater annually. While the total storage capacity proposed is 3,000 gallons, due to annual rainfall patterns in Petaluma, a rain tank can fill and empty 1.5 times throughout a year on average. Therefore, we can assume that all 4,500 gallons may be captured and reused in place of municipal water. When the tank is full, overflow should be directed to a front yard rain garden.

- 2b: Two 530 gallon "slimline" tanks can be placed in the back yard to harvest rainwater from all three back yard downspouts. The two downspouts that drain water under the deck can be piped to a slimline sited in the specified location. A second slimline tank can harvest water from the corner downspout. The catchment area drains about 7,444 gallons of rainwater annually. Considering the tank fills and empties 1.5 times annually, rainwater can supply up to 1,590 gallons for outdoor water use. Overflow can be directed to a back yard rain garden (priority 3a) or otherwise directed to the existing sump pump drainage system.

Increased on-site water storage can be used to offset 95% of the irrigation demand associated with the climate appropriate planting and fruit tree projects. See the attached *Rainwater Harvesting Design Template* for more information.

Priority 3 – Laundry to Landscape Greywater Reuse: Water used in the laundry machine can be reused in the back yard to establish and irrigate new fruit trees and companion plants. Water can be piped from the exterior, along the wall, and buried in the ground to eventually outlet in mulch basins near fruit trees and perennials. Water from the laundry machine has the potential to offset irrigation demand by up to 4,960 gallons/year which is enough to irrigate all existing back yard plantings and multiple additional fruit trees. The City of Petaluma offers a $125 rebate for material associated with a laundry to landscape systems. Learn more at https://cityofpetaluma.org/greywater-system-rebate/. See the *Laundry to Landscape Design Template* for more information.

Priority 4 - Rain Gardens: Rain gardens are a strategy of rainwater harvesting that collects water in the landscape to provide passive irrigation. Rain gardens are intentional basins or depressions where water slows and sinks into the landscape, watering plants and recharging underground aquifers. Well draining soil-mix coupled with water-loving plants should allow the rain garden to drain within 72 hours to avoid vector issues. All rain gardens must have a planned overflow at its lowest point.

- 4a & 4b: Rain gardens can capture water that drains from both front yard downspouts that currently drain to the landscape. In a high intensity storm (85% percentile design storm), these two downspouts will drain 315 gallons of stormwater. The drawn rain gardens are large enough to hold over 415 gallons of stormwater before overflowing to the street. Adjacent plantings will benefit from increased soil saturation.
- 4c: A rain garden can be dug in the back yard lawn area to sink water that drains from the back yard downspouts which currently contribute to flooding issues. The water should be directed away from the home and allowing it to drain in a rain garden before overflowing to the existing drainage sump pump on the west side of the home. Excavated soil can be used in a berm between the home and the sited rain garden.
- 4d: Curb cut rain gardens involve openings in the curb that allow stormwater from the street to enter the sidewalk strip and gather in a planted rain garden. After the basin fills with water the surplus will continue down the street. A permit through the City of Petaluma and a licensed contractor is required before altering the curb.

Directing run-off to rain gardens keeps stormwater on-site which benefits overall watershed health. Stormwater run-off impairs watersheds by transporting pollutants from roads to waterways. Rain gardens not only reduce run-off and filter water before it overflows to storm drains, but they also increase water conservation by maintaining soil moisture for longer. Supplemental drip irrigation is recommended during the dry season. See the *Rain Garden Design Template* for more information.

By converting the existing lawn to low water use plantings watered with drip irrigation, harvesting rainwater, and reusing greywater, the municipal water demand for outdoor use on the landscape can be completely offset. New planting areas, irrigated by rainwater and greywater, will build soil and increase food access. For further questions about the designs and projects please email morgan@dailyacts.org and consult resources provided for more technical information about installation of the water-wise practices proposed.

Existing Conditions vs Proposed Conditions

Approximated using GeoDesign by Watershed Progressive

	Outdoor Water Demand (Gal/Yr)	Rainwater Harvesting Potential (Gal/Yr)	Rainwater Harvesting Storage (Gal)
Existing Conditions	32,980	0	0
Proposed Conditions	6,500	13,200	4,060

	Rainwater Offsetting Outdoor Water Use (Gal/Yr)	Laundry to Landscape Greywater Reuse (Gal/Yr)	Total Outdoor Water Reuse (Gal/Yr)
Existing Conditions	0	0	0
Proposed Conditions	6,090	4,900	10,990

	Municipal Water Demand for Outdoor Use (Gal/Yr)	Rain Garden Capacity (Gal)	Stormwater Run-Off (Gal/85% Storm)
Existing Conditions	32,980	0	1,040
Proposed Conditions	0	1,150	0

Thank you for your interest in the Land Resilience Partnership and water conservation. Together we can create a beautiful and climate resilient Petaluma by implementing practices and solutions throughout our community. Our relationship to the land matters, and by shifting our spaces to better align with nature and environmental needs, we can take steps towards health and resilience in the community in the midst of climate change.