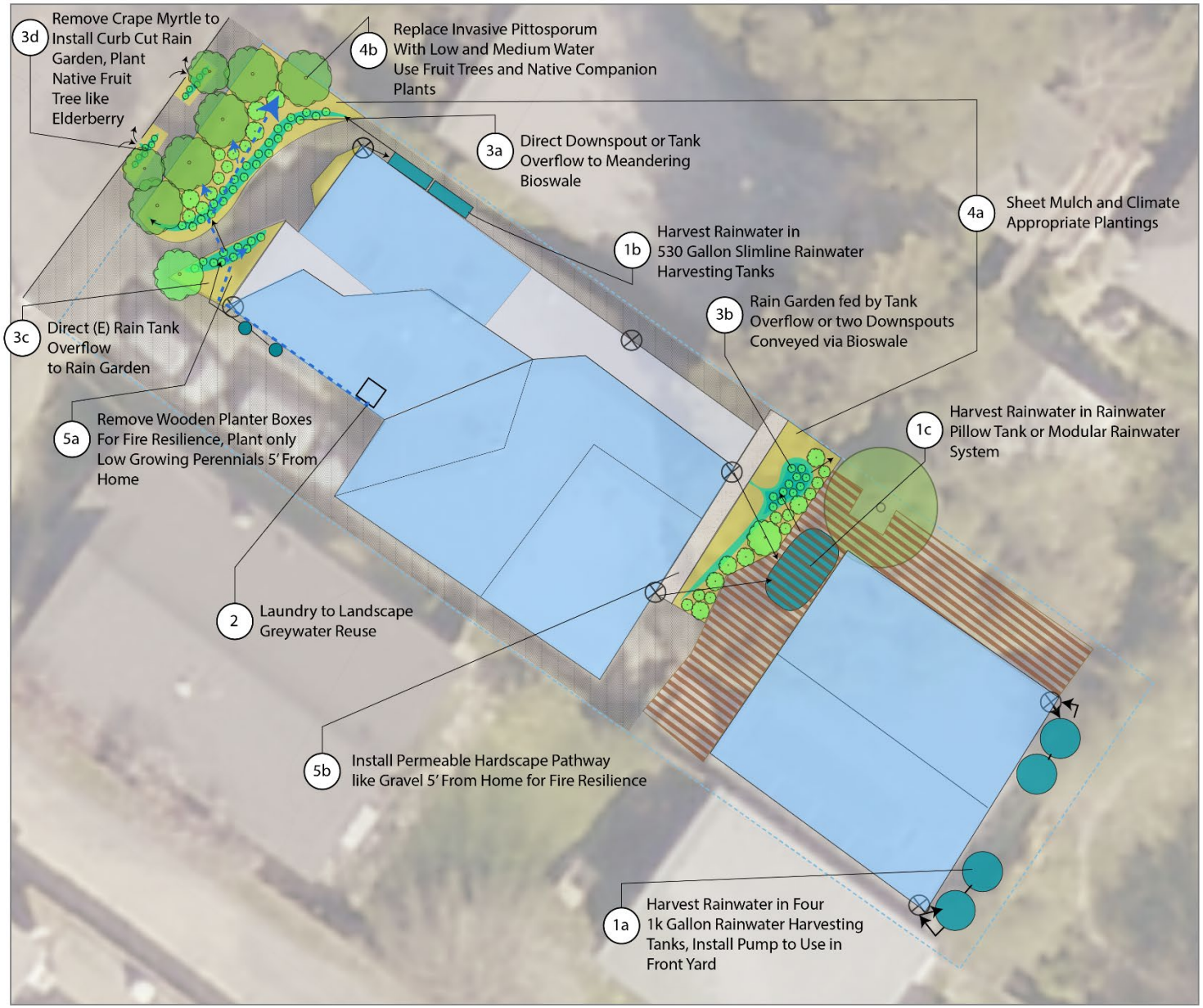
Petaluma River Watershed Land Resilience Partnership
Catalog of Projects

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) Non-Permeable Hardscape
- (E) Downspouts
- (E) Deck
- (E) Trees
- Sheet Mulch and Climate Appropriate / Pollinator Plantings
- Rainwater Catchment Area
- Permeable Hardscape
- Rainwater Storage Tank and Overflow
- Slimline Rainwater Storage Tank and Overflow
- Laundry to Landscape Greywater Reuse
- Rain Garden and Bioswale
- Fruit Tree
- Climate Appropriate Plantings
- Flow of Water and Piping

LAND RESILIENCE PARTNERSHIP
Daily Acts
DAILYACTS.ORG
201 1ST STREET STE 100
PETALUMA, CA 94952
(707) 789-9664

BASEMAP

Not for Construction

N
W
E
S

Summary of Catalog of Projects

The residence is a shady oasis in Petaluma's midtown. While the amount of available landscape for gardening is limited, the residents have the potential to transform their yard to produce more food and pollinator habitat while storing water in tanks and within the landscape. 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 - 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 estimated outdoor water demand for the existing plantings is about 1,700 gallons per year, whereas the new fruit trees and climate appropriate plantings suggested in priority 4 will increase the outdoor water demand to 2,480 gallons per year during plant establishment. While the residence already has 110 gallons of rainwater storage installed, the COP recommends additional opportunities to increase rainwater storage capacity. While it is not necessary to install all recommended systems, this is intended as a catalog of various tank options to supply the needed amount of water for your landscape.

- 1a: Four 1,000 gallon tanks can be placed behind the studio to harvest rainwater that drains from the two downspouts. The entire roof area drains to these downspouts, draining 14,000 gallons of rainwater annually. While the total storage capacity proposed is 4,000 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 6,000 gallons may be captured and reused in place of municipal water. When the tank is full, overflow should be directed back to the existing downspout drain.
- 1b: Two 530 gallon tanks can be placed in the eastern side-yard to harvest rainwater from the north-east downspout. The catchment area drains about 5,140 gallons of rainwater annually. Considering the tanks fill and empty 1.5 times annually, rainwater can supply up to 1,590 gallons of outdoor water use. Overflow for a tank in this location should be directed to the rain garden proposed in 3a.
- 1c: Rainwater from the two backyard downspouts can be collected in a "pillow tank" or another tank that fits under the existing deck. The two backyard downspouts drain about 8,750 gallons of water annually. A pillow tank can store up to 2,500 gallons. Overflow should be directed to the proposed rain garden discussed in 3b.

Increased on-site water storage can be used to offset 100% of the irrigation demand associated with new and existing plantings, although rainwater should not come into contact with the edible portion of leafy greens. See the attached *Rainwater Harvesting Design Template* for more information.

Priority 2 – Laundry to Landscape Greywater Reuse: Water used in the laundry machine can be reused in the front yard to water existing plants and irrigate new fruit trees and companion plants. The greywater can be piped through the wall and directed to the front yard by affixing PVC pipe to the wall until it reaches the landscape. The pipe can then be piped under the concrete pathway to distribute greywater throughout the front yard. Water from the laundry machine has the potential to offset irrigation demand by up to 2,480 gallons/year which is exactly 100% the proposed outdoor water demand. Furthermore, 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 3 – 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, irrigating 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.

- 3a: A meandering rain garden can be fed by the northeast downspout to capture and allow water to percolate into the soil adjacent to existing and new plantings. In a high intensity storm (85% percentile design storm), this downspout will drain 190 gallons of stormwater. The drawn rain garden is large enough to hold over 200 gallons of stormwater before overflowing to the street. A berm should be constructed between the swale and home to ensure water

drains to the sidewalk.

- 3b: A rain garden in the backyard can be fed by the two backyard downspouts. Currently, these downspouts drain 300 gallons in a 24-hour storm directly to the landscape. By directing this water to a rain garden planted with water loving plants, this water can be transformed from a nuisance to a resource. The overflow should be directed away from the home.
- 3c: The overflow from the existing rain barrels is currently directed to the front yard via pipe. Instead of flowing off the site, this water should be held in the ground with a rain garden. As discussed in priority 5, the existing garden boxes may become a fire hazard, however, a rain garden would strengthen fire resilience by creating a hydrated buffer around the home if irrigated during the dry season.
- 3d: Curb cut rain gardens harvest stormwater from the street to passively irrigate water loving plants. By removing a section of curb that separates the sidewalk strip from the road and creating a basin, water is encouraged to gather in the sidewalk strip. Curb cuts positively benefit the watershed by reducing stormwater run-off and filtering polluted water before entering nearby creeks and streams. While the existing non-native crape myrtles would not benefit from extra water, they could be replaced with native shrubs and shade trees like elderberry or sycamore.

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.

Priority 4 - Sheet Mulching and Climate Appropriate Planting: Sheet mulching is recommended in all indicated sections of landscape with existing and new plantings. Sheet mulching is a weed suppression and soil health technique that composts weeds in place, while building soil and an optimal environment to plant perennials. 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 builds soil health and increases the soil carbon sponge. Refer to the *Mulching* design template for more information.

While Pittosporum doesn't use much water, they are considered invasive and have little ecosystem benefit. By instead planting native or climate appropriate fruit bearing trees, the landscape can provide food and support habitat. Native plants support habitat for local and migratory birds and beneficial insects while enhancing beauty. Climate appropriate plants are native to Mediterranean climates and therefore are adapted to drought conditions, needing little supplemental water. Drip irrigation is recommended to provide plants with enough water during establishment. Increased water demand can be fully provided by rainwater and greywater. Refer to the *Climate Appropriate Planting Design Templates* for a plant pallet and more information.

Priority 5 – Fire Resilient Landscaping: Fire resilience standards are increasingly important as the risk of fire increases and insurance policies becomes stricter. The most important consideration for fire resilience is that no combustible material should be within a 5' buffer from the home. Therefore, wooden garden boxes and fences against the home may increase risk. Furthermore, gravel pathways within the buffer is the best option for maintaining permeability without weeds growing against the house. Fire resilience can be considered when selecting plants for outside the 5' buffer. 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/.

By expanding rainwater harvesting and storage, reusing greywater, and planting climate appropraite and fruit bearing plants, the landscape at 522 E D Street can become even more of a food producing ecological oasis while completely eliminating municipal water demand for outdoor use. 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 Drainage Area Potential (Gal/Yr)	Rainwater Harvesting Storage (Gal)
Existing Conditions	1,700	5,000	110
Proposed Conditions	2,480	34,000	7,560

	Rainwater Offsetting Outdoor Water Use (Gal/Yr)	Laundry to Landscape Greywater Reuse (Gal/Yr)	Total Outdoor Water Reuse (Gal/Yr)	Municipal Water Demand for Outdoor Use (Gal/Yr)
Existing Conditions	165	0	165	1,535
Proposed Conditions	11,340	2,480	13,820	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.