

Comprehensive Ecologically Sensitive Vegetation Management Report 2020 & 2021

ANNUAL PROGRAM REPORTS TO THE BOARD OF DIRECTORS
CONSERVATION GRAZING
INTEGRATED PEST MANAGEMENT
WILDLAND FIRE RESILIENCE
NATURAL RESOURCES AND LAND & FACILITIES

Midpeninsula Regional Open Space District

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2020 / 2021 Comprehensive Ecologically Sensitive Vegetation Management

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

CONSERVATION GRAZING PROGRAM (2020 AND 2021)

INTEGRATED PEST MANAGEMENT ANNUAL REPORT (2020 AND 2021)

WILDLAND FIRE RESILIENCY PROGRAM ANNUAL REPORT (MAY THROUGH DECEMBER 2021)

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Acronyms and Abbreviations

Acronym/Abbreviation	Meaning
CEQA	California Environmental Quality Act
Board	Board of Directors
District or Midpen	Midpeninsula Regional Open Space District
FRA	Fuel Reduction Area
IPM	Integrated Pest Management
Midpen or District	Midpeninsula Regional Open Space District
RMP	Resource Management Policies
VMA	Vegetation Management Area
WFRP	Wildland Fire Resiliency Program

INTRODUCTION

Midpeninsula Regional Open Space District (Midpen) is a public agency that owns and manages 26 open space preserves, helping to preserve over 65,000 acres of land (as of 2021). Created by a voter initiative in 1972, Midpen's mission statement is “To acquire and preserve a regional greenbelt of open space land in perpetuity; **protect and restore the natural environment**; and provide opportunities for **ecologically sensitive public enjoyment and education**.” On the Coast, Midpen has an expanded mission to also acquire and preserve agricultural land of regional significance, preserve rural character and encourage viable agricultural uses of land resources.

Midpen boundaries enclose an area of 227,900 acres in northern Santa Clara and southern San Mateo counties and a small portion of Santa Cruz County. Extending from Montara in the north to the Lexington Hills in the south, Midpen serves more than 25 communities with a combined population of over 700,000. Preserves vary in size from 55 acres (Stevens Creek Nature Study Area) to over 19,000 acres (Sierra Azul). Elevations range from sea level in the baylands preserves to 3,486 feet atop Mount Umunhum in the Sierra Azul Range.

Midpen manages land primarily to preserve a regional greenbelt of open space land. There are few improvements besides parking areas, unpaved trails and roads, some restrooms, and informational signs. Over 250 miles of public trails invite activities such as hiking, jogging, horseback riding, biking and dog walking, where allowed. The preserves are open to the public every day, free of charge. Because the preserves are “close to home”, they serve as popular weekday and weekend recreational destinations.

Midpen lands protect various habitats rich in both numbers and the variety of plants and animals. Midpen stewards tidal salt marshes in the baylands, home to the endangered clapper rail and salt marsh harvest mouse and used by thousands of migratory birds. The heart of Midpen straddles the eastern and western flanks of the Santa Cruz Mountains. These lands are covered in a diverse mix of oak woodland, grassland, chaparral, coastal scrub, and both evergreen and coniferous forests that form an impressive scenic backdrop for the densely populated San Francisco Bay Area and Central California Coast. Creeks and streams that run through Midpen lands provide a refuge area for endangered coho salmon and threatened steelhead trout. The natural setting of Midpen preserves provides a peaceful refuge for visitors seeking low-intensity recreational opportunities away from the pressures of urban life.

Midpen's vegetation management goal is to sustain and promote viable and diverse native plant communities characteristic of the region.

MIDPEN PROGRAMS AND PROJECTS COVERED IN THIS REPORT

CONSERVATION GRAZING PROGRAM

Where appropriate, Midpen manages land with livestock conservation grazing that is protective of the natural resources and that is compatible with public access to maintain and enhance the diversity of native plant and animal communities, manage vegetation fuel for fire protection, help sustain the local agricultural economy, and preserve and foster appreciation for the region's rural agricultural heritage. The Conservation Grazing Program is included in this report as this program also encompasses part of Midpen's broader work in managing and maintaining vegetation (grassland) communities on Midpen lands.

California Environmental Quality Act (CEQA) compliance is completed on a case-by-case basis for each Ranch under the Conservation Grazing Program.

INTEGRATED PEST MANAGEMENT PROGRAM

Midpen controls pests using IPM principles that protect and restore the natural environment and provide for human safety and enjoyment while visiting and working on District lands.

The Board certified the Final Program Environmental Impact Report (FEIR) and approved the Integrated Pest Management Program on December 10, 2014 (R-14-148). On February 27, 2019, the Board adopted a resolution approving an addendum to the FEIR and related minor project modifications to the IPM Program (R-19-11).

This report presents the results of the sixth and seventh year of pest management activities prescribed under the Midpeninsula Regional Open Space District (Midpen) Integrated Pest Management (IPM) Program. Prior to the certification and adoption of the Wildland Fire Resiliency Program (described below), all fire management activities were handled under the IPM Program.

WILDLAND FIRE RESILIENCY PROGRAM

Midpen manages land for wildland fire under the concepts of ecological resiliency to: reduce the severity of wildland fire and to reduce the impact of fire suppression activities within Midpen Preserves and adjacent residential areas; manage habitats to support fire as a natural occurrence on the landscape; and promote Midpen and regional fire management objectives. Midpen also manages land to retain and promote biologically diverse, dynamic forest conditions; maintain and enhance high quality forest and aquatic habitat; encourage and enhance the development of late-seral conifer forest; provide for quality visitor experiences within diverse forest habitat; and promote Midpen and regional fire management objectives.

The Board certified the Final Program Environmental Impact Report and approved the Wildland Fire Resiliency Program (WFRP) on May 12, 2021 ([R-21-58](#), [Minutes](#)).

This report presents the results of the first nine months of wildland fire resiliency activities prescribed under Midpen's WFRP Program. Prior to the certification and adoption of the WFRP all fire management activities were performed within the IPM Program.

PROJECTS NOT COVERED UNDER MIDPEN APPROVED PROGRAMS

The three Programs discussed in this report represents the vast majority of vegetation management conducted under the direction of Midpen. Projects that are not captured under these programs, such as mitigation for capital improvement or restoration work tied to public access (e.g., Mt. Umunhum summit restoration), are discussed at a high-level for informational purpose only and are fully covered in separate monitoring documents that are specific to those projects.

RESOURCE MANAGEMENT POLICIES

The complex and constantly changing ecosystems of Midpen preserves are comprised of a wide variety of interrelated components and resources that sometimes have competing needs for preservation. Land managers must be able to recognize, distinguish, and decide among competing priorities. Compounding these inherent challenges are the adjustments to open space management that may need

to occur over time due to various factors, including: the ongoing growth in land acreage managed by the Midpen; changes in stewardship practices and priorities; funding sources that come and go; changes in public interests, values, and use patterns over both time and place; and a growing level of visitation that can place increased pressure upon natural systems. A well-defined set of policies are essential to guide Midpen's resource management efforts despite these changes.

Midpen's Board-adopted Resource Management Policies (RMP) form a "living" document that grows and evolves based on new experience and information. It is reviewed and updated every five to ten years and chapters amended as needed to respond to ever-changing resource conditions (e.g., insect or disease outbreaks, large cataclysmic events, climate change etc.). Staff may recommend and (or) the Board may decide to amend the document for a significant single purpose at any time. Midpen last updated the RMP in spring of 2022.

The full Resource Management Policies document can be found at https://www.openspace.org/sites/default/files/Resource_Management_Policies.pdf.

At this time, staff does **NOT** recommend any changes to the adopted Resource Management Policies.

SUMMARY OF VEGETATION MANAGEMENT FOR ECOSYSTEM RESILIENCE AND ENHANCED FIRE MANAGEMENT

ECOLOGICALLY SENSITIVE VEGETATION MANAGEMENT PRACTICES

Ecologically sensitive vegetation management is primarily focused on maintaining and improving high biodiversity and ecological health on the landscape.

Midpen's land management practices include vegetation management to improve native species habitat, maintain patrol routes and recreational facilities (e.g., parking lots and trails), and reduce wildland fire risk.

Per the Board of Director's approved RMPs, Midpen staff consider the following practices at each project site to minimize impacts and maximize benefits to natural resources when performing vegetation management in Midpen preserves. Staff review and update these guidelines on an ongoing basis:

- Conducting pre-management surveys for special status species and nesting birds
- Providing a biological monitor during work when needed
- Designating refugia for wildlife
- Leaving tree canopies at the landscape-level intact
- Leaving buffers around special-status species' habitat
- Leaving buffers around bodies of water
- Seasonally timing work to avoid or decrease potential impacts to birds, bats, other wildlife, and botanical resources designed for retention
- Prioritizing the treatment of invasive species
- Minimizing ground disturbance
- Minimizing the presence of people and mechanized/motorized equipment in wildlands during vegetation management
- Matching source material for nursery plants and seed to the site-specific requirements for maintaining genetic diversity while taking climate change into account
- Considering the changing climate and its impacts to habitats
- Mowing in patterns that allow any wildlife present to easily and safely move away
- Mimicking natural disturbance processes to maintain rare habitats
- Avoiding the spread of invasive non-native species and disease with cultural controls such as cleaning boots and equipment prior to and after work
- Trimming trees designated for retention using basic ANSI Standards to minimize disease infection and progression of decay thus decreasing its vulnerability to fire in long term

MAJOR ACCOMPLISHMENTS

LANDSCAPE-LEVEL MONITORING PROTOCOL

The landscape -level monitoring protocol has improved since the last report given the acquisition of the following datasets in San Mateo and Santa Clara Counties and will further improve in the future with the completion of datasets in Santa Clara County.

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The San Mateo County fine scale vegetation map was completed in the spring of 2022. Deliverables include:

- 6-inch ortho imagery acquisition
- Countywide 1 foot Lidar derived contours
- Countywide Canopy Height Model, Closure Model, and Raw Ladder Fuels Raster
- Enhanced Lifeform Map
- Improved centerlines of Countywide roads, trails, and dozer lines
- San Mateo Countywide 5m Fuels Mapping
- Countywide Impervious Surfaces Mapping
- Fine-scale vegetation map, including relative cover for forested stands and standing-dead

The Santa Clara and Santa Cruz fine scale vegetation map is on schedule to be completed in the spring of 2023. Deliverables completed to date include:

- Enhanced vegetation lifeform map
- Multi-class impervious/pervious surfaces map
- Countywide lidar derived topographic layers
- 5m surface fuel model

ENHANCED FIRE MANAGEMENT FUEL REDUCTION WORK

A total of 59.5 acres of Enhanced Fire Management work on Midpen lands was completed by September 2022 that was funded by a State Coastal Conservancy (SCC) Grant. The \$400,000 grant was awarded in July 2021. Work was successfully completed in and around Kings Mountain manzanitas habitat in three preserves: El Corte de Madera, La Honda Creek, and Thornewood. Kings Mountain manzanita requires more open canopy to flourish. In the past, naturally occurring wildland fire would have provided these conditions. In addition, some treatment of outlier blackwood acacia from forested lands in Purisima Creek Redwoods was completed.

PUBLIC NOTIFICATIONS AND INQUIRIES

PUBLIC NOTIFICATIONS

Midpen notifies the public of plans for vegetation management projects as part of board meeting notification processes. During these public board meetings, Midpen describes the public notices that were sent for the item and any required CEQA compliance. Below are descriptions of numerous public meetings that were held in 2020 and 2021, which included prior public notification.

At the June 24, 2020 meeting, the Board authorized the General Manager to enter into a three-year agreement with the San Mateo County Resource Conservation District to perform education and outreach activities regarding invasive, non-native species, as well as limited invasive, non-native plant treatment to support efforts in protecting native plant biodiversity.

At the November 18, 2020, meeting, the Board authorized the General Manager to enter into a contract with Hanford ARC of Petaluma for invasive species management services across all preserves. This contract was granted for a one-year period for the 2021 calendar year, with the possibility to extend up to four years. The contract with Hanford ARC has since been extended for an additional calendar year. At the same meeting, the Board authorized the General Manager to enter into a contract with

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Applied Technology & Science for environmental planning and biological consulting services to determine the feasibility and maximum net natural resource benefits of restoring a section of Purisima Creek Redwoods Open Space Preserve.

Midpen also conducted two public hearings to solicit and gather public input on the Wildland Fire Resiliency Program Draft and Final Environmental Impact Reports in February and May 2021, respectively. Public notices were sent via postal and electronic mail to responsible agencies, stakeholders, and adjacent neighbors. Hard copies were also available at the Midpen's administration and field offices along with selected fire stations within district boundaries.

CEQA NOTIFICATIONS

Midpen prepared a Notice of Preparation (NOP) of a Draft EIR for the Wildland Fire Resiliency Program to inform agencies and interested parties that an EIR was being prepared. The Draft EIR public review period ended on March 1, 2021. The announcement of availability of this document was given wide distribution among the public and responsible agencies.

In accordance with CEQA, Midpen provided all commenting public agencies with an opportunity to review proposed responses to agency comments at least 10 days prior to certification of the Final Program Environmental Impact Report (PEIR). Notifications were mailed to agencies on April 30, 2021, to review proposed responses to comments. The comments received on the Draft PEIR and the responses to those comments are provided in the Final PEIR, which was released on April 30, 2021 for public review. The Responses to Comments contains copies of comments received during the public review period and responses to those comments.

NOTIFICATIONS OF PESTICIDE APPLICATIONS

Per the IPM Best Management Practices, Midpen employees and/or contractors post signs at treatment areas notifying the public, employees, and contractors of a planned use of a pesticide (including herbicides, insecticides, or other types of pesticides) prior, during, and after the application on District preserves. The posting periods described below are the posting minimum requirements; signs may be posted earlier and left in place for longer periods of time if it serves a public purpose or if it provides staff flexibility in accessing remote locations.

BMP#	Best Management Practice
8	Notification of Pesticide Application Signs shall be posted notifying the public, employees, and contractors of the District's use of pesticides. The signs shall consist of the following information: product name, signal word, and manufacturer, active ingredient, and EPA registration number; target pest; preserve name; treatment location in preserve; date and time of application; date which notification sign may be removed; and contact person with telephone number. Signs shall generally be posted 24 hours before the start of treatment and notification shall remain in place for 72 hours after treatment ceases. In no event shall a sign be in place longer than 14 days without dates being updated. See the IPM Guidance Manual for details on posting locations, posting for pesticide use in buildings and for exceptions.

NOTIFICATIONS OF PROJECTS USING OTHER COMMUNICATION CHANNELS

In partnership with the Los Gatos Creek Watershed Collaborative (LGCWC), Midpen had planned a wildland fire protection and fuels management project at Bear Creek Redwoods Open Space District. Using the California Vegetation Treatment Program (CalVTP), the District created a Project-Specific

Analysis (PSA) to satisfy CEQA and approve the project. The project was posted on the CalVTP Online Viewer under the Proposed Projects section for public notification and viewing on October 5, 2020.

PUBLIC INQUIRIES

Public inquiries received outside of public meetings is summarized in the table below. The District received several inquiries in 2020 and 2021 concerning the IPM and Wildland Fire Resiliency Programs through phone, email, or in person. No inquiries regarding the Conservation Grazing Program were received outside of public meetings.

Table 1: Public Inquiries into the IPM and Wildland Fire Resiliency Program

Date	Inquirer	Contact Method	Request/Comment	Response
3/25/2021	Preserve Volunteer	In person	Inquired about mistletoe management in Midpen lands; person expressed concern about conifer mortality due to mistletoe aggression.	Midpen does not have an active approach to managing mistletoe. Mistletoe has not been identified as a major concern.
3/25/2021	Preserve Visitor	Email	Concerned about shaded fuel break work near rare plant habitat. Visitor sent coordinates for where rare plant population was located.	Thanked the volunteer for their diligence and forwarded the information and best management practices to the project manager.
5/14/2021	Preserve Visitor	Phone	Not pleased with invasive plant control with contractors spraying herbicide and playing loud music	Explained safety protocols in place to protect people and the environment. Contacted the contractors to turn down volume of their music.
5/24/2021	Preserve Visitor	Email	Sent photo of a grass asking if it was the invasive slender false brome.	Staff informed the visitor that it was not slender false brome. The visitor was directed to the San Mateo Resource Conservation District's webpage about slender false brome.
Multiple	Preserve Visitor	Various (email, board meetings)	Submitted a variety of information requests and concerns about Midpen practices.	Staff provided several point by point responses and engaged in discussion with the person.
Multiple	Preserve Visitors	Emails	Preserve visitors inquiring with volunteer program staff about the feasibility of groups volunteering to clear	Staff replied with links to our fire and IPM plans, and current opportunities for volunteers

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Date	Inquirer	Contact Method	Request/Comment	Response
<i>Multiple</i>			underbrush to prevent wildfires.	
	Preserve Neighbors	Various (email, calls,)	Neighbors reached out to volunteer program staff with concern about specific weed/sites with the intention of removing with other neighbor help.	Staff called, emailed and/or met with neighbors to address concerns and explain volunteer projects as predetermined by an approved IPM plan and process for involvement.

EXPERIMENTAL VEGETATION MANAGEMENT PROJECTS

No Experimental Vegetation Management was conducted in 2020 or 2021. Due to the onset of the COVID-19 pandemic, work was halted for safety precautions and many vegetation management projects were left unmanaged during the first 6-8 months of the pandemic. To manage vegetation management setbacks caused by time delay in management, priorities were set to focus on putting more effort into existing project areas rather than focus on new experimental projects.

CONSERVATION GRAZING PROGRAM

Midpen's conservation grazing program manages approximately 9,000 acres of coastal property as rangelands. On these lands, Midpen uses grazing as a broad management tool to achieve outcomes for both conservation of biodiversity and fuel management to reduce wildfire risk while supporting local sustainable agriculture. Grazing reduces the height and thatch build-up of non-native annual grasses, which benefits native bunch grasses and forb species. Since grasslands generally support more plant diversity than nearby wooded or brushy areas, control of non-native annual grasses is one of the most significant actions that can be taken to promote plant diversity. In addition, several special status wildlife species benefit from the vegetation structure created by grazing activity. As the conservation grazing program continues to grow, Midpen will continue to work with grazing tenants to develop new grazing strategies that target priority invasive plant species.

Grazing is also an effective tool to reduce biomass and fuel loads, which helps reduce the intensity of wildfires. Using mechanical methods for fuel management can be prohibitively expensive, and grazing allows fuel reduction at scales that would be infeasible with other methods. Additionally, brush removal for rangeland improvement contributes to a significant amount of fuel management District-wide.

Table 2: Properties currently in the Conservation Grazing Program as of December 31, 2021

Preserve	Property	Total Acres ¹
La Honda Creek	Apple Orchard	301
	Driscoll Ranch	2,711
	Event Center	3
	Lone Madrone ²	631
Miramontes Ridge	Johnston Ranch	412
Purisima Creek Redwoods	Bluebrush Canyon	303
	Elkus-Lobitos	837
	October Farms	283
	South Cowell	358
Russian Ridge	Mindego Hill	1,148
Tunitas Creek	Gordon Ridge	543
	Toto Ranch	769
	Tunitas Creek Ranch	703
Total		9,002

SUMMARY OF PARAMETERS MONITORED

Each year, staff surveys Midpen rangelands to document condition and changes in the status of the natural resources. General attributes, such as level and distribution of use by livestock, occurrences of

¹ The acreage accounts for grazing leases, and may include ungrazed land (e.g., drainages, brush patches, etc.).

² Formerly known as McDonald Ranch.

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native and non-native plants and animals, condition of soils and surface waters, condition of infrastructure, and impacts of human activities are tracked with an emphasis on change in status that can inform future management decisions. Surveys take place through several visits to each site over the course of the year and conclude with fall monitoring focused on the completion of residual dry matter (RDM) surveys.

MONITORING RESULTS AND QUALITATIVE ASSESSMENT FOR 2020

All sites had residual dry matter above the minimum target range as prescribed by each respective rangeland management plan. Stands of native grassland species have generally been maintained in good condition. Several native grassland bird species are abundant and were frequently observed during rangeland surveys. Several areas were identified as priorities for non-native invasive plant treatment or brush management to reduce fuels and maintain open grassland habitat. A few infrastructure projects were identified as priorities to expand the use of grazing to meet conservation goals.

MONITORING RESULTS AND QUALITATIVE ASSESSMENT FOR 2021

Most sites had residual dry matter above the minimum target range as prescribed by each respective rangeland management plan. In 2021 there were three sites that had very low RDM in at least some areas. These included the Apple Orchard, Gordon Ridge, and Tunitas sites. Staff worked with the grazing tenants at these sites to reduce stocking rates to facilitate recovery of these areas. Despite low RDM in those locations, stands of native grassland species have generally been maintained in good condition. Several native grassland bird species continue to be abundant and were frequently observed during rangeland surveys. Several areas were identified as priorities for non-native invasive plant treatment or brush management to reduce fuels and maintain open grassland habitat. A few new infrastructure projects were identified as priorities to expand the use of grazing to meet conservation goals.

SUCCESSIONS AND DIFFICULTIES IN REACHING TREATMENT OBJECTIVES

Both 2020 and 2021 were very dry years, which presented a significant challenge to conservation grazing activities. Under these conditions, some sites were limited by water availability, which is a critical component to effective grazing management. Other sites had sufficient water but limited forage production under the drought conditions. Both drought-related factors challenge Midpen's ability to utilize livestock to meet conservation goals. Staff worked with tenants to reduce overall stocking rates and in some cases to adjust the timing of seasonal use in response to drought conditions. All three sites that had low RDM values in 2021 showed improvement following adjustments to stocking rates and other sites were maintained in good condition despite the consecutive years of drought.

High rates of shrub succession in grassland areas on the coast continues to be a challenge to protecting the unique biodiversity of the conservation grazing properties. Some tenants have been proactive about working with staff to treat brush-encroached grasslands (primarily by mowing). Staff will develop more effective integrated strategies for this challenge in the coming years. While there are several invasive non-native plants that negatively affect the conservation grazing program, some such as distaff thistle, are particularly difficult to manage. Staff worked with contractors in 2020 and 2021 to make some progress on two areas within the conservation grazing program that have large infestations of distaff thistle. These areas continue to be a high priority for IPM work with the grazing program.

IPM ANNUAL REPORT

Integrated Pest Management is a method for efficiently managing plant and animal pests while protecting human health and the environment. Midpen adopted an [IPM Guidance Manual](#) to direct its management of harmful invasive plants and animals within preserves, as well as rodents and insects in Midpen-owned buildings.

Midpen biologists develop specific multi-year IPM plans based on the biology of the pest, ecological conditions at the treatment site and any potential secondary impacts such as soil erosion. Nonchemical techniques to control pests, like prevention, pulling, cutting, digging, mowing and/or setting traps, are considered before chemical methods.

The IPM Guidance Manual specifies that Midpen will prepare an Annual IPM Report each year that describes pest control activities (both chemical and non-chemical) on lands managed by Midpen. The draft Annual IPM Report is prepared by the IPM Coordinator and reviewed by the IPM Coordination Team. Once approved by the IPM Coordination Team, the final report is presented to the General Manager for initial approval. The report is then forwarded to the Board of Directors for review and approval. The Annual IPM Report (including this one) includes the following basic information:

1. A summary of pest problems encountered during the year, and a comparison to past years.
2. A summary of pest control treatments, presented by type of control (e.g., mowing, herbicide use). Wherever possible, a comparison of units treated (e.g., acres, square feet, linear feet or miles) in the current year and previous years are provided for comparison purposes. A cost per acre is provided for major pest control treatment types.
3. A qualitative assessment of the effectiveness of the pest control program, and suggestions for increasing future effectiveness.
4. A summary of pesticide use, presented by category (e.g., herbicide, insecticide), active ingredient or pesticide formulation.
5. A brief summary of public notifications and public inquiries about IPM on Midpen lands;
6. Assessment of compliance with the Guidance Manual, including:
 - a. An evaluation of the effectiveness of any changes in practices that were implemented in the past 12 months.
 - b. A description of any experimental pest control projects (test studies) and the results, including a cost/benefits analysis.
 - c. Suggested changes to the IPM program or the Guidance Manual's pest control practices proposed for adoption within the next 12 months including:
 - d. Any substitute pesticides to replace phased out pesticides (additions to the List of Approved Pesticides).
 - e. Any proposed alternative pesticides (additions to the List of Approved Pesticides) or pest control methods proposed for adoption.

EARLY DETECTION / RAPID RESPONSE

Early Detection / Rapid Response (EDRR) places emphasis on preventing the establishment of new pest populations on Midpen lands through increased surveys for pests. If new pest populations get established, EDRR would implement rapid response measures to control pests before they spread. EDRR programs increase the likelihood that pest invasions are addressed successfully before the population sizes and/or extents are beyond that which can be practically and economically contained and eradicated. Midpen treats several species considered to be early detection targets (i.e., spotted

knapweed, hanging sedge); however, a dedicated early detection surveillance program helps ensure timely discovery and treatment of emerging threats.

Increased pest surveys may allow Midpen personnel and/or contractors to identify and prevent pest infestations prior to establishment, thereby decreasing the amount of pest management treatments necessary on Midpen lands over time more rapidly. The IPM Guidance Manual includes EDRR strategies to respond to pests, however, current staffing levels and commitments limit Midpen's ability to fully implement a comprehensive EDRR program. Midpen is currently evaluating the long-term resource (i.e., staffing, volunteers, contractors, etc.) and funding needs to implement the EDRR strategies, which include:

- Identifying potential threats early to allow control or mitigation measures to be taken;
- Detecting new invasive species in time for allowing efficient and safe eradication or control decisions to be made;
- Taking additional preventive actions such as providing facilities to clean vehicles and tools to stop the spread of seeds of invasive plants;
- Responding to invasions effectively to prevent the spread and permanent establishment of invasive species;
- Providing adequate and timely information to decision-makers, the public, and to partner agencies concerned about the status of invasive species within an area; and
- Adaptively implementing detection and early response strategies over time.

Midpen had planned to implement a small-scale effort of EDRR strategies in 2020, but due to the COVID-19 pandemic, this work project was postponed. Midpen is currently in the process of incorporating this effort in 2023 and will bring those results and recommendations to the full Board during the 2023 Annual IPM Report.

SUMMARY OF PEST PROBLEMS

PRE-TREATMENT SURVEYS

Midpen's Best Management Practices from the FEIR Integrated Pest Management Program (Board certified and approved in December of 2014 with an addendum in January of 2019) outlines the use of pretreatment surveys. Specifically, it states:

A District-approved biologist shall survey all selected treatment sites shortly before work to determine site conditions and develop any necessary site-specific measures. Treatment sites are defined as areas where IPM activity, including manual, mechanical, and chemical treatment, is expected to occur. In addition, on a repeating basis, grassland treatment sites shall be surveyed by a District-approved biologist once every five years and brushy and wooded sites shall be surveyed once every five years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Site inspections shall evaluate existing conditions at a given treatment site including the presence, population size, growth stage, and percent cover of target weeds and pests relative to native plant cover and the presence of special-status species and their habitat, or sensitive natural communities.

Surveys are entered into CalFlora, an online database. In 2020 and 2021, Midpen-approved biologists completed surveys at the following locations:

Table 3: Number of Pre-Treatment Site Surveys Per Preserve

Preserve	2020	2021	Grand Total
Bear Creek Redwoods	3	36	39
Coal Creek	2		2
Fremont Older	2		2
La Honda Creek	36	4	40
Long Ridge	3		3
Los Trancos	2	26	28
Miramontes Ridge	1	1	2
Monte Bello		50	50
Pulgas Ridge		1	1
Purisima Creek Redwoods	4	11	15
Rancho San Antonio	1		1
Russian Ridge		30	30
Saratoga Gap		3	3
Sierra Azul	61	16	77
Skyline Ridge	2	85	87
St. Joseph's Hill	1		1
Thornewood	3	1	4
Tunitas Creek		4	4
Windy Hill	8		8
Grand Total	129	268	397

ONGOING AND GENERAL MAINTENANCE

VEGETATIVE PEST SPECIES

Sixty-eight (65) plant pest species found on Midpen lands are treated on an on-going basis to control for asset-based protection and long-term management. These species have the potential to invade natural areas, displace native plant and wildlife species, and reduce biodiversity. Of the listed species, the California Department of Food and Agriculture (CDFA) considers twenty-one (21) treated over the past 2 years as noxious weeds.

Table 4: Species Treated

Year	Species Treated	Cal-IPC Rating				CDFA Rated	Alert	State Noxious Weed
		Watch	Limited	Moderate	High			
Since 2015*	98	5	17	30	14	6	4	21
2015	15	0	2	6	5	1	2	9
2016	34	1	3	13	12	1	2	17
2017	40	2	5	15	10	1	2	15
2018	45	3	7	16	12	2	2	17
2019	47	2	5	19	11	3	2	17
2020	46	1	5	21	12	2	3	16
2021	52	4	9	18	13	2	3	19

* Summary line identifies total number of individual plant species that apply to each category listed in this table. Note – this is not a total of all lines below since the same species is often treated or monitored many multiple years.

Since the inception of the IPM Program, Midpen has treated a total of 98 different species, which represent approximately 2.7% of all plant species within the Santa Cruz Mountain Region. For both reporting years of 2020 and 2021, it represents less than 2% of all species.

FAUNA PEST SPECIES

Nine (9) different species of invasive fauna were monitored and/or treated in 2020.

Table 5: Fauna Pest Species Monitored or Treated in 2020

Scientific Name	Common Name	Preserve	Location	Activity
<i>Felis catus</i>	Cat, feral	Rancho San Antonio	Preserve-wide	Monitoring
<i>Lithobates catesbeianus</i>	Bullfrog	Russian Ridge	Mindego Lake	Monitoring
		Bear Creek Redwoods	Upper Lake	
		La Honda Creek	Rodeo Pond	
		Skyline Ridge	Alpine Lake	
<i>Mus musculus</i>	House mouse	Multiple – see below	Deer Hollow Farm; Residential	Monitoring, Trapping
<i>Otospermophilus beecheyi</i>	California Ground squirrel	Rancho San Antonio	Deer Hollow Farm	Exclusion

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Scientific Name	Common Name	Preserve	Location	Activity
<i>Pseudemys nelsoni</i>	Florida red-bellied cooter	Skyline Ridge	Alpine Pond	Trapped and removed in 2018
<i>Rattus norvegicus</i>	Norway rat	Multiple – see below	Deer Hollow Farm; Residential	Monitoring, Trapping
<i>Rattus rattus</i>	Black rat	Multiple – see below	Deer Hollow Farm; Residential	Monitoring, Trapping
<i>Sus scrofa</i>	Pig, feral	Russian Ridge	Mindego Ranch	Monitoring
		Sierra Azul	Cherry Springs Reservoir	
<i>Trachemys scripta elegans</i>	Red-eared slider	Bear Creek Redwoods	Mud Lake	Monitoring, Trapping

Eight (8) different species of invasive fauna were monitored and/or treated in 2021.

Table 6: Fauna Pest Species Monitored or Treated in 2021

Scientific Name	Common Name	Preserve	Location	Activity
<i>Felis catus</i>	Cat, feral	Rancho San Antonio	Preserve-wide	Monitoring
<i>Lithobates catesbeianus</i>	Bullfrog	Russian Ridge	Mindego Lake	Monitoring
		Bear Creek Redwoods	Upper Lake	
		La Honda Creek	Rodeo Pond	
		Skyline Ridge	Alpine Lake	
<i>Mus musculus</i>	House mouse	Multiple – see below	Deer Hollow Farm; Residential	Monitoring, Trapping
<i>Otospermophilus beecheyi</i>	California Ground squirrel	Rancho San Antonio	Deer Hollow Farm	Exclusion
<i>Rattus norvegicus</i>	Norway rat	Multiple – see below	Deer Hollow Farm; Residential	Monitoring, Trapping
<i>Rattus rattus</i>	Black rat	Multiple – see below	Deer Hollow Farm; Residential	Monitoring, Trapping
<i>Sus scrofa</i>	Pig, feral	Russian Ridge	Mindego Ranch	Monitoring
		Sierra Azul	Cherry Springs	Monitoring
<i>Trachemys scripta elegans</i>	Red-eared slider	Bear Creek Redwoods	Mud Lake	Monitoring, Trapping

PEST CONTROL IN BUILDINGS

Between January 2020 and December of 2021, Midpen contracted with *Complete Pest Control* to perform rodent control at eleven Open Space Preserve locations, with twenty-four residences (plus an

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additional 4 structures). Midpen has performed all rodent control since 2013 using traps and exclusion methods, and without the use of any rodenticides. Locations of IPM in buildings are listed below:

Table 7: Pest Control in Buildings

Preserve	# of Buildings in 2020	# of Buildings in 2021
El Corte de Madera	4 + 1 (garage)	4 + 1 (garage)
Fremont Older	2	1
La Honda	4 + 1 (water cistern)	4 + 1 (water cistern)
Monte Bello	2	1
Purisima Creek Redwoods	0	1
Rancho San Antonio	2	2
Russian Ridge	5 + 1 (garage/laundry room)	5 + 1 (garage/laundry room)
Skyline Ridge	1	1
Thornewood	2	2
Tunitas Creek	1 + 1 (water pump house)	0
Windy Hill	1	1
Total	24 + 4 (other)	22 + 3 (other)

FUEL MANAGEMENT (JANUARY 2020 THROUGH MAY 2021 ONLY)

Midpen works with local communities and fire districts to minimize the potential for fire from spreading to and from Preserve lands. Midpen provides necessary fire and fuel management practices to protect forest resources, public health, and safety by taking the following actions:

- Maintain essential roads for emergency fire access, and forest management activities to reduce fire hazard.
- Maintain adequate fire clearance around Midpen structures and facilities.
- Encourage neighboring property owners to maintain adequate fire clearance around existing private development; consult with regulatory agencies to encourage that construction of new development maintains fire agency recommended setbacks for fire clearance between new development and Midpen forests and woodlands.
- Evaluate the potential to reduce forest fuel loading through the removal of smaller trees to reduce forest floor fuel buildup and ladder fuels.
- Coordinate with fire agencies and local communities to define locations where fire protection infrastructure is desirable and practical.
- Reintroduce fire as a resource management tool to reduce forest floor fuels and reestablish fire for ecosystem health where stand conditions, access, and public safety permit; coordinate with other agencies for planning and implementation.
- Seek grant opportunities and partnerships for fuel management projects and monitoring.

Activities related to fuels management were conducted under the IPM Program until the Wildland Fire Resiliency Program was adopted by the Board of Directors in May of 2021.

FUEL REDUCTION PROJECTS

Midpen currently maintains various types of fuel breaks at many preserves. This work is accomplished primarily through mechanical means using handheld power tools or heavy equipment. In addition to the acreage listed below, Midpen maintains approximately 30 miles of disc lines (a gap in vegetation or other combustible material that acts as a barrier to slow or stop the progress of wildfire, created by plowing the ground with a tractor pulling a disc harrow apparatus), mostly along Preserve boundaries.

The IPM program covers the maintenance of existing fuel breaks and does not allow for the construction of major new fuel breaks.

Table 8: Summary of Fuel Reduction Projects (Jan 2020 through May 2021)

Purpose	Acres		Total Acres
	Foothills	Skyline	
Defensible Space	21.9	33.23	55.13
Landing Zones	6.5	5.25	11.76
Shaded Fuel Breaks	36.8	22.7	59.5
Other Fuel Breaks	-	14.4	12.2
Total	65.2	75.58	140.78

NEW PEST CONTROL PROJECTS

Potential pest control projects are submitted to the IPM Coordinator using Midpen's New Pest Control Project form. Potential projects are evaluated using the Project Ranking System developed by the IPM Coordination Team. The Project Ranking System evaluates projects using five categories:

- Safety
 - o Human health
 - o Environmental health
- Prevents and controls the most destructive pests
- Protects biodiversity
- Provides for public engagement
- Feasibility and effectiveness

Three (3) new pest control projects in 2020 and three (3) new projects in 2021 were determined to have a high priority for treatment on District lands.

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Table 9: New Pest Control Projects for 2020

Scientific Name	Common Name	Preserve	Cal-IPC Rating	CDFA Rating	Alert	Gross Acres	Person Hours
<i>Eucalyptus globulus</i>	Blue gum eucalyptus	El Sereno	Limited ³	N/A	N/A	0.425	75
		Los Trancos				0.69	600
		Windy Hill				0.20	100

Table 10: New Pest Control Projects for 2021

Scientific Name	Common Name	Preserve	Cal-IPC Rating	CDFA Rating	Alert	Gross Acres	Person Hours
<i>Centaurea solstitialis</i>	Yellow star thistle	El Sereno	High	Noxious	N/A	0.282	35
		Pulgas Ridge				2.266	55
<i>Cortaderia jubata</i>	Pampas grass	Pulgas Ridge	High	Noxious	N/A	0.001	5

SUMMARY OF PEST CONTROL TREATMENTS

INVASIVE PLANT CONTROL

The following data reflects natural areas and does not include brushing/mowing of roads, trails, defensible space, or emergency landing zones. Data for brushing/mowing of roads, trails, defensible space, or emergency landing zones are not presented because these activities do not change from year to year.

Manual weed pulling remains the most common treatment method at 70% of all hours. Herbicide use increased 13% from 2019, accounting for 16% of all hours from 2020-2021. In a typical year, herbicide use accounts for approximately 10% of labor hours and may have periods of increased use as new projects are initiated. In 2020 and 2021, the increased ratio of herbicide work was mostly caused by the COVID-19 pandemic pausing volunteer-based hand removal projects that would have maintained or increased the total number of manual weed-pulling hours recorded for the two years. In contrast, contractor crews, which are often utilized for difficult-to-control invasive species and are trained and registered to use limited amounts of herbicides, were only minimally affected by the pandemic disruptions. In addition, an increased treatment of weeds using herbicides was necessary prior to the initiation of the Los Gatos Creek Watershed Forest Health project at Bear Creek Redwoods starting in 2022. These increased herbicide treatments were necessary to control weed populations that are adapted to disturbance and aggressively regrow after mechanical treatments.

During the creation of the IPM Annual Plan, treatment methods are evaluated using the best available science in weed management. The IPM Annual Plan, which is finalized in January of each year, lays out the work plan for the new calendar year. Treatment methods have shifted across the seven years of the Program, with the largest change in the reduction of hours spent applying herbicide (reduced from

³ Although Cal-IPC rates this species as a “Limited” rating State-wide, Midpen and other partner agencies treat this species as a “Moderate” rating within the Central Coast Region.

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61% to 16%, with a relative reduction of 45%) and the largest increase in the percentage of hours spent hand pulling (increased from 36% to 70%, with a relative increase of 34%).

The total number of hours for IPM-related work (Table 11) has increased by 14% from 2015 levels. Field staff hours have fluctuated since 2015 depending on other annual competing priorities, including the number of scheduled Measure AA capital improvement projects under construction. Volunteer and contractor hours have increased substantially since 2015. The hiring of a second Volunteer Program Lead in 2018 increased the capacity of volunteers for IPM projects. Due to the COVID-19 pandemic, volunteer activities were restricted, and the numbers of participants declined to pre-2016 levels. In 2021, volunteer restrictions and local government restrictions were loosened leading to an increase in volunteerism. Increased contractor hours are primarily due to large scale, Measure AA project-related restoration and/or mitigation work (e.g., Mt. Umunhum summit restoration, Bear Creek Redwoods parking lot mitigation, and Madonna Creek landfill removal). In addition, a five-year Memorandum of Understanding (MOU) grant agreement with Santa Clara Valley Water District (Valley Water) (R-17-79) provided substantial funding for IPM related work at Bear Creek Redwoods Open Space Preserve that began in 2017.

Table 11: Annual IPM-related field work hours by crew type

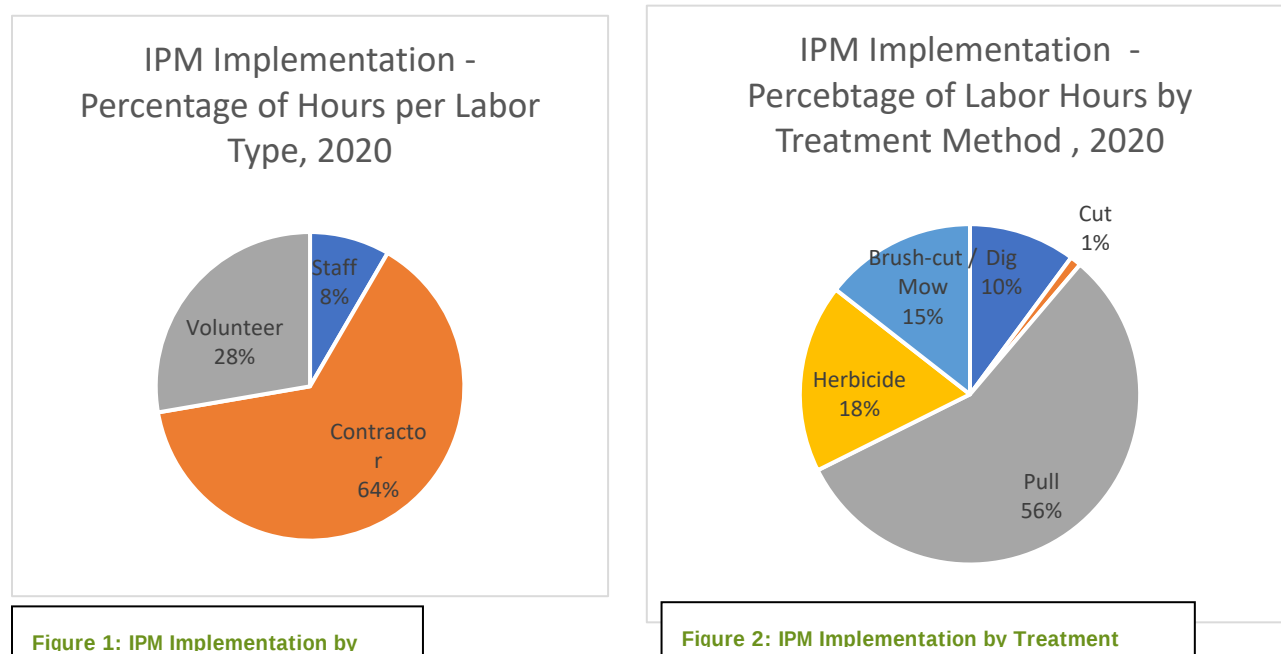
Year	Staff	Contractor	Volunteer	Total
2015	5,431	2,132	1,736	9,299
2016	Unknown ⁴	1,659	2,883	4,542
2017	623	2,907	2,559	6,089
2018	1,767	5,197	3,520	10,484
2019	1,502	6,421	4,261	12,184
2020	667	5,082	2,203	7,952
2021	960	5,999	3,722	10,680

TREATMENT IN 2020

⁴ Staff hours were not recorded into the Weed Database or CalFlora as this was a transitional year from one database to another.

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Table 12: Total Treatment Hours by Labor Source and Method, 2020



Method	Staff	Contractor	Volunteer	Total
Dig	67	552	152	771
Cut	7	31	19	57
Pull	375	4,106	2,013	6,494
Herbicide	119	112	0	231
Brush-cut / Mow	96	282	0	378
Grand Total	664	5,082	2,184	7,930

TREATMENT IN 2021

IPM Implementation - Percentage of Hours per Labor Type, 2020

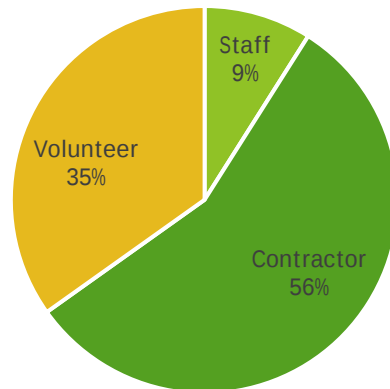


Figure 3: IPM Implementation Labor Hours, 2021

IPM Implementation - Percentage of Labor Hours by Treatment Method, 2021

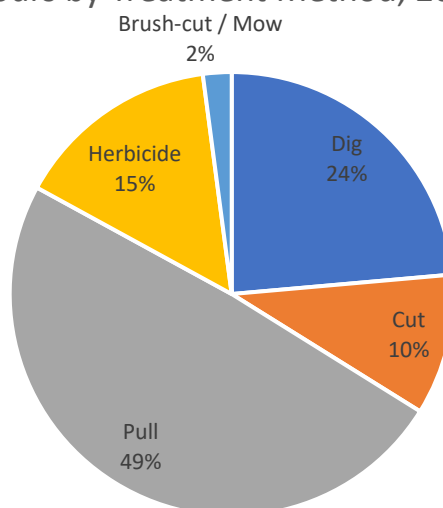


Figure 4: IPM Implementation Labor Hours By Treatment Method, 2021

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Table 13: Total Treatment Hours per Labor Source and Method, 2021

Method	Staff	Contractor	Volunteer	Total Hours
Dig	226	9	399	635
Cut	99	589	436	1,124
Pull	471	3,626	2,855	6,952
Herbicide	144	342	0	485
Brush-cut / Mow	20	1,434	3	1,457
Grand Total	960	5,999	3,693	10,652

Increased contractor hours are primarily due to large scale, Measure AA project-related mitigation work. In 2020 and 2021, 1,003 contractor hours were spent removing non-native plant species at mitigation sites. Mitigation is required when Midpen projects may potentially cause impacts to natural areas. This work often requires increased labor for restoration planning, site preparation, planting, site maintenance, and up to 10 years of follow-up monitoring.

Table 14 (below) shows the comparative cost for different treatment methods for 2020 and 2021. Midpen uses the following hourly costs estimates for comparative cost analysis purposes only:

Table 14: Hourly Costs Estimates Per Labor Type

Crew Type	2020	2021
Contractor⁵	\$51.57	\$69.34
Staff⁶	\$45.18	\$46.30
Volunteers⁷	\$33.61	\$35.56

⁵ Average hourly costs are derived from a selection of invoices from work performed by contractors.

⁶ Average hourly costs were provided by the Finance Department.

⁷ Signifies the estimated value of volunteer work and not true cost, as this is pro bono, volunteer work. This value is used for analysis purposes only. Refer to: <https://independentsector.org/news-post/new-value-volunteer-time-2019/>

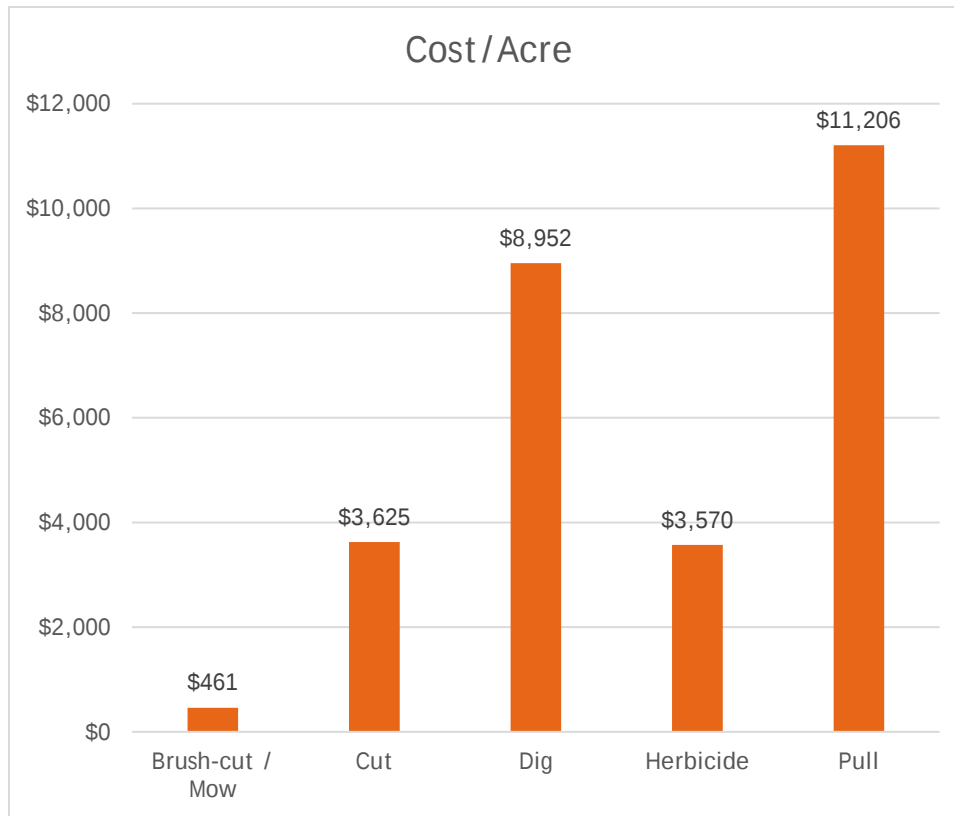


Figure 5: 2020 and 2021 average treatment cost per acre

Mowing and brush cutting are shown above in Figure 5 as cost per gross acre. All other treatment methods are shown as cost per infested acre.

EFFECTIVENESS OF PEST CONTROL PROGRAM

The IPM Program identifies the following criteria for assessing the effectiveness of the Program every year:

- Work health/exposure in buildings;
- Reduction of pesticide use in buildings;
- Per-acre herbicide use;
- Preservation of biodiversity and natural resource values;
- Public participation in pest control; and
- Staff training, public outreach, and educational activities.

WORKER HEALTH/EXPOSURE IN BUILDINGS

Midpen is committed to lowering worker health/exposure risk classifications in buildings when pesticides are used. Specific pesticides were approved for use in and around buildings (Table 15) and are described in the 2014 IPM Program Environmental Impact Report. All are "Caution" labeled and pose a reduced risk to workers or occupants of treated buildings. A specific type of rodenticide bait

(Cholecalciferol) is approved for use under very strict conditions; however, it was not utilized. Only prevention and traps were approved for rodent control in 2020 and 2021.

Table 15: Approved pesticides used in buildings

Pesticide Category	Active Ingredient	Product Formulation	Purpose	Signal Word
Rodenticide	Cholecalciferol	Cholecalciferol baits	Rodent control	Caution
Insecticide⁸	Indoxacarb	Advion Gel baits	Structural pest control	Caution
	Hydroprene	Gentrol Point Source	Structural pest control I	Caution
	Fipronil	Maxforce Bait Station	Structural pest control I	Caution
	Sodium tetraborate	Terro Ant Killer II	Structural pest control	Caution
	Diatomaceous earth	Diatomaceous earth	Structural pest control	Caution

REDUCTION OF PESTICIDE USE IN BUILDINGS

The District seeks to comprehensively oversee all pesticide use in and around District buildings, including use by tenants, which is expected to result in an overall reduction of pesticide use in buildings, and in particular, eliminate the use of pesticides around human occupants or visitors, or when chemicals can inadvertently escape into the surrounding wildland environment.

PEST CONTROL NOT COVERED BY IPM PROGRAM

Structural pests that live within the soil and wood components of these structures, such as termites, wood boring beetles, and wood decaying fungi, are not included in the IPM program. Occurrences of these species are addressed by Midpen on a case-by-case basis.

In 2020 and 2021, Midpen conducted two termite treatments within buildings. One fumigation treatment at Fremont Older Open Space Preserve in August 2020 and one orange oil treatment at Tunitas Creek Open Space Preserve in June 2021.

WASP CONTROL FOR PUBLIC SAFETY

Many social wasps such as yellow jackets are native species and are generally only considered pests when their nests are located in areas where they are incompatible with human use. For example, when social wasps nest under the eaves of buildings or alongside trails, they can sometimes exhibit aggressive protective behaviors that can threaten humans with painful stings that can cause allergic reactions in some people. In locations where multiple stinging incidents occur, Midpen staff control wasp nests using physical or chemical control methods. From 2020-2021, there were eight (8) yellow jacket nests treated with the pesticide Wasp Freeze II (active ingredient Prallethrin), all along trails.

⁸ Employees, contractors, and tenants may install approved ant and roach bait stations inside buildings in tamperproof containers without review by a Qualified Applicator License/Certificate holder.

PER-ACRE HERBICIDE USE

Midpen seeks a reduction in per-acre usage of herbicides over time at individual sites and acknowledges that in some instances, chemical use will initially increase, followed by a reduction in herbicide use once the pest is eliminated or reduced. Most projects utilize an integrated treatment approach, which incorporates several different treatment methods throughout the life of the project. Initial treatment can consist of intensive chemical or mechanical methods and will typically shift towards low-intensity manual methods as the infestation becomes under control and the seedbank is eliminated.

Pulses of increased herbicide use should be expected in future years as new projects are initiated due to Midpen acquiring new lands with priority infestations, and/or prioritizing new pest management sites on exiting lands.

Midpen staff selected twelve (6) distinct herbicide projects to perform trend analysis:

- Bear Creek Redwoods, Phase I (BCR);
- Big Dipper Ranch (Big Dipper);
- La Honda;
- Mindego Hill;
- Slender False Brome (SFB); and
- Stinkwort.

Midpen used the Mann-Kendall Statistical test for trend analysis; for more information on this test, see the “Statistics How To” webpage at <https://www.statisticshowto.com/mann-kendall-trend-test/>. Aligning with other land management agencies, the confidence interval is set at 80%.

Four of the six selected treatment sites have shown a decline in herbicide use over time, with several sites no longer requiring any herbicide use at all. The other two site are currently showing no trend in herbicide use. As the density of the target invasive plant species declines, manual and mechanical treatment methods become more feasible and desirable. This is the expected trend for all herbicide treatment sites within the IPM program, including the two sites below that as of 2021 had not yet shown a trend.

Table 16: Herbicide use trend analysis by project.

Project	SFB Program	Mindego Hill	La Honda	BCR	Stinkwort	Big Dipper
Herbicide	Roundup	Milestone	Milestone	Roundup	Roundup	Transline
Trend	No Trend	No Trend	DECREASING	DECREASING	DECREASING	DECREASING

PRESERVATION OF BIODIVERSITY AND NATURAL RESOURCE VALUES

As part of this section, Midpen staff provides an annual qualitative assessment of natural resource conditions of IPM projects in natural areas, rangelands, and agricultural properties in the Annual IPM Report.

NATURAL AREAS

In natural areas, manual, mechanical, and limited herbicide methods were used to control high priority invasive plants to protect and restore native vegetation at preserves.

YELLOW STAR THISTLE MANAGEMENT AT HAWTHORNS SPRING 2020 UPDATE

Grassroots Ecology and Midpen began a partnership in 2015 to provide land stewardship and volunteer engagement at the Hawthorns Area of Windy Hill Open Space Preserve. One component of the partnership is to manage for invasive plant yellow star thistle (YST) using strategic timed mowing accompanied by volunteer's hand pulling.

The management strategy for YST at Hawthorns is timed mowing followed by hand removal of re-sprouts by volunteers. The goal is to reduce the population to a point where hand pulling is the only needed treatment method.

Grassroots Ecology staff determines the annual mowing schedule based on visual inspection of the phenology of the plants in the target YST areas. Effective mowing should take place after the plants have bolted and lost their basal leaves, but before seeds have matured and dispersed. At this stage the YST has expended most of its energy into the bolted growth and no longer has the basal leaves to create sufficient energy through photosynthesis. The first mow usually falls around the summer solstice, with a secondary mow occurring 2 weeks later. The secondary mow is helpful to catch stray plants and resprouts, thereby reducing the number of plants that need to be handpulled. As the population decreases overtime and the number of resprouts remains low enough that it can be managed by hand pulling, a secondary mow becomes less critical.

Monitoring began in June 2017 to collect baseline data before the first mow. Monitoring is completed annually within five of the seven mow areas about 1-2 weeks before mowing takes place. There are seven target areas within Hawthorns that are currently managed for YST. Since the monitoring period, the total estimated yellow star thistle has reduced 99% from an estimated 475,000 plants to 3,200 plants. Work will continue in 2022 with mowing likely to be reduced or stricken from the management methods if the population is of a manageable size for hand pulling.

RANGELAND

In rangeland areas, herbicide and non-herbicide methods were used to control high priority invasive plants to enhance the diversity of native plants and animals; help sustain the local agricultural economy; foster the region's rural heritage; and manage fuel (flammable vegetation) for fire protection. For specific information on the Conservation Grazing Program, please see the Conservation Grazing Program section of this report.

In the absence of natural disturbance (i.e., fire), Midpen periodically does brush removal on grasslands to slow brush encroachment. Projects have led to a reduced cover in brush and some areas had highly improved native herbaceous cover. In 2020 and 2021 staff worked with grazing tenants on multiple sites to identify priority areas for brush management. Typically, areas where species like coyote brush (*Baccharis pilularis*) are colonizing grasslands with high cover or richness of native herbaceous species are identified as the highest priorities for management. Mowing has been an effective way to open the brush canopy and native herbaceous species typically respond very positively to this management. Follow up treatment is usually required within 2-4 years to maintain grassland areas.

Timed mowing has also been a key tool to manage invasive grasses. In 2020 and 2021, two separate small (<50 m²) stands of the non-native invasive grass medusahead (*Elymus caput-medusae*) were detected in the Mindego Hill area of Russian Ridge Open Space preserve. Staff coordinated with contractors to carry out timed mowing treatments on each of these occurrences. Because medusahead relies heavily on annual seed inputs to maintain populations and because it flowers much later than most species that it competes with, mowing during the flowering stage to interrupt seed development

can be an effective and fairly selective management strategy. Both of these occurrences from 2020 and 2021 have had reduced abundance of medusahead following mowing. Staff will continue to monitor in subsequent years to determine what further management action is required.

VOLUNTEER CONTRIBUTIONS TO IPM

The public is an integral part of the success of the IPM program. Volunteers who assist with invasive plant control and detection are a valuable asset to the IPM program. In 2020-2021, the Land Steward (formerly Preserve Partners) volunteers contributed 2,777 hours to resource management through one hundred, twenty-three (123) group projects. Midpen hosted seven (7) Community Group Steward projects, a subset of Land Stewards, which includes school groups, local companies, scouts, hiking clubs, and other community groups.

Land Steward projects primarily focused on addressing twelve (12) invasive plant species: French broom, Spanish broom, yellow star thistle, Italian thistle, milk thistle, bull thistle, fennel, summer mustard, teasel, stinkwort, vinca, and tocalote. There were 19 active Advanced Resource Management Stewards (ARMS) in 2020. ARMS volunteers work independently on resource management projects in designated preserve areas on their own time. In 2021, six new volunteers joined the ARMS program. In total, ARMS volunteers contributed 2,076 hours to resource management in 2020-21 with project sites located in eighteen (18) open space preserves.

STAFF TRAINING, PUBLIC OUTREACH, AND EDUCATIONAL ACTIVITIES

STAFF TRAINING

The mandatory annual Pesticide Safety Training was held for all field staff, staff biological monitors, and contractors virtually in May of 2020 and again in 2021. The former IPM Coordinator, Tom Reyes, presented the required California Department of Pesticide Regulation training in 2020. Rangers who only handle Wasp Freeze, received an abbreviated training focused on wasp control.

Due to the COVID-19 pandemic, the usual annual staff wildflower trainings were cancelled in 2020 and 2021. Typically, these wildflower trainings are put on by qualified botanists to guide staff in grasslands of a selected preserve with high biodiversity. The site walks serve as a training to inform staff of native and non-native plant species.

Annual special status species and habitat awareness training was provided in person in 2020 prior to the COVID 19 pandemic. In 2021, staff were primarily working remotely during the pandemic, so they were directed to view the recording and slides from the 2020 training. This training is an annual requirement that includes an overview of special status species, their habitat, where to find up to date information, laws and regulations pertaining to these species, how to avoid impacts, and a section specific to California red-legged frog and San Francisco garter snake for staff working in areas in which these species occur.

REGIONAL COOPERATION

Invasive species are not limited by jurisdictional boundaries, so it is of utmost importance to work with neighboring land management agencies to target invasive species at a regional scale. Midpen is a part of numerous regional cooperatives, including the San Mateo and Santa Clara Weed Management Areas (WMA). These cooperatives are coordinated from the County Agricultural Commissioner's offices and help foster communication and cooperation on high-priority species among agencies in the given

region. Through WMAs, Midpen can apply for grants to receive funding for treating invasive species across multiple jurisdictions.

Midpen is also a part of the Santa Cruz Mountains Stewardship Network (SCMSN), which aims to coordinate actions across all three counties (San Mateo, Santa Clara, and Santa Cruz) in the Santa Cruz Mountains. Midpen is helping to develop an “Atlas” in partnership with Cal-IPC and CalFlora to help facilitate the sharing of GIS data related to invasive species and other natural resources.

SUMMARY OF PESTICIDE USE

The following tables summarize the use of pesticides on Midpen lands by staff and contractors. This data excludes Pacific Gas and Electric (PG&E), which is not covered under Midpen’s Integrated Pest Management Program. PG&E is required to report pesticide use to each County Agricultural Department separately.

Table 17: Pesticide Use on Midpen Lands, 2020

Pesticide Type	Trade Name	Active Ingredient	Amount Used (ounces)	Gross Acre Treated (acres)	Ounces/Acre
Fungicide	Reliant	Potassium salts of phosphorus acid	-	-	-
Herbicide	Milestone	Aminopyralid	3.2	2.1	1.5
	Envoy Plus	Clethodim	-	-	-
	Transline	Clopyralid	-	-	-
	Roundup Custom	Glyphosate	142.8	6.8	21
	Roundup ProMax	Glyphosate	20	0.6	33.2
	Polaris	Imazapyr	0.3	15.2	0.02
	Capstone	Triclopyr + aminopyralid	-	-	-
	Garlon 4 Ultra	Triclopyr	3	1.7	1.8
Insecticide	Wasp Freeze II	Prallethrin ⁹	122.5	N/A	N/A
Rodenticide		Cholecalciferol	-	-	-
Virucide¹⁰	Virex II 256	Didecyl dimethyl ammonium chloride	55.5	N/A	N/A
	Waxie 730	Hydrogen peroxide	-	-	-

⁹ Prallethrin is used only to treat stinging insects when they pose a direct threat to public safety (i.e., nests adjacent to trails, restrooms, and parking lots).

¹⁰ Both virucides were used under Governor Newsom’s declaration of a State of Emergency on March 3, 2020, until July 14, 2021, when the Board adopted a Resolution terminating a local Midpeninsula Regional Open Space District emergency in response to the COVID-19 Pandemic.

Table 18: Pesticide Use on Midpen Lands, 2021

Pesticide Type	Trade Name	Active Ingredient	Amount Used (ounces)	Gross Acre Treated (acres)	Ounces/Acre
Fungicide	Reliant	Potassium salts of phosphorus acid	-	-	-
Herbicide	Milestone	Aminopyralid	27.6	1.6	17.2
	Envoy Plus	Clethodim	-	-	-
	Transline	Clopyralid	-	-	-
	Roundup Custom	Glyphosate	222	6.5	34.4
	Roundup ProMax	Glyphosate	236	12.7	18.6
	Polaris	Imazapyr	-	-	-
	Capstone	Triclopyr + aminopyralid	-	-	-
	Garlon 4 Ultra	Triclopyr	17.7	9.1	1.9
Insecticide	Wasp Freeze II	Prallethrin ⁶	84.5	-	-
Rodenticide		Cholecalciferol	-	-	-
Virucide¹¹	Virex II 256	Didecyl dimethyl ammonium chloride	7	-	-
	Waxie 730	Hydrogen peroxide	256	-	-

CHANGES TO GUIDANCE MANUAL

UPDATING THE LIST OF APPROVED PESTICIDES

The List of Approved Pesticides is intended to change over time as the science of pest control advances and more effective, safer, and less harmful pesticides are developed; as manufacturers update, discontinue, or substitute products; and as target pests change over time.

In instances where new products with new active ingredients are found to be safer, more effective, and/or less costly than products on the List of Approved Pesticides, Midpen may elect to add new pesticides. This type of change typically requires additional toxicological review, and depending on the results, may also require additional environmental review.

USE OF THE DISINFECTANT VIREX II AND WAXIE 730

Per the IPM program, in the event of an emergency (such as a human health disease outbreak), pesticides that are not included on the List of Approved Pesticides may be used for short periods. In these unusual situations Midpen will comply with required regulatory procedures, then will evaluate

¹¹ Both virucides were used under Governor Newsom's declaration of a State of Emergency on March 3, 2020, until July 14, 2021, when the Board adopted a Resolution terminating a local Midpeninsula Regional Open Space District emergency in response to the COVID-19 Pandemic.

the emergency response pesticide use and determine if its IPM program needs to be modified to accommodate similar future emergencies.

To protect staff during the COVID-19 pandemic, Midpen had started using the viral disinfectant Virex II (active ingredient didecyl dimethyl ammonium chloride) to clean offices, vehicles, and other high-touch surfaces. Virex II, in its undiluted form is registered as a pesticide, and only trained staff who hold valid Qualified Applicator Certificates (QAC) with the CA Department of Pesticide Regulation (DPR) are authorized to mix the undiluted product. Midpen was only cleaning with the product in its diluted form, which is not regulated and is a widely used cleaning disinfectant. However, since it was only available in concentrate, trained staff had to first dilute it for use as a disinfectant. Midpen staff continued to use Virex II to clean surfaces at regular intervals throughout the duration of the pandemic.

In June 2021, the COVID-19 Emergency Declaration was rescinded and authorization to use Virex II was no longer permitted. After more information came available about how to disinfect for the SARS-CoV-2 virus (virus that causes the COVID-19 disease), staff began to use Waxie 730 in place of Virex II.

Midpen staff recommend adding the product Waxie 730 for disinfecting surfaces to prevent the spread of viruses. Waxie 730 contains the active ingredient hydrogen peroxide and, upon review, has been deemed to have no significant effect on public or environmental health when applied in accordance with the label. This product will help keep visitors and staff healthy and help prevent the spread of viruses, including the SARS-CoV-2 virus that causes the COVID-19 disease. Staff recommends that the maximum amount of Waxie 730 be set at four gallons of concentrate per year.

The approval of hydrogen peroxide is recommended solely for the use of disinfecting surfaces to prevent the spread of viruses. After a comprehensive review, Midpen staff have determined that hydrogen peroxide does not pose any reasonable safety concerns to the public or harm to the environment when applied at the proper specifications. The Annual IPM Report, as approved by the General Manager and accepted/approved by the Board of Directors will be the basis for making changes to the Program, including modification of any IPM procedures or changes to the List of Approved Pesticides.

10-YEAR REVIEW OF IPM PROGRAM

The IPM Program adopted in December 2014 was intended to be reviewed after 10 years. Starting in 2023, Midpen will begin this 10-year detailed review to assess the program's strengths and weaknesses and determine what changes need to be made. One current change to the program that Midpen is considering, is to center the program on the goal of restoring sites rather than controlling specific species. This way, Midpen can take a more holistic approach to restoring habitats and prioritize work areas around specific ecosystems in need of enhancement. The goal is to make changes to the program for implementation in 2025.

The following is the proposed timeline for the review:

Meeting Type	Description	Expected Date
Stakeholder	Review current and proposed changes to the IPM Program	Q2-Q4 FY24
Public Meeting	PNR	Q1 FY25
Public Meeting	Study Session	Q2 of FY25
Public Meeting	Approval of Program and associated CEQA documentation	Q4 of FY25

WILDLAND FIRE RESILIENCY PROGRAM REPORT

The WFRP specifies that Midpen will prepare an Annual Program Report each year that describes actions conducted in the previous year. The report is presented to the General Manager for initial approval. The report is then be forwarded to the Board of Directors for review and acceptance/approval. Annual reports, including this one, include the following basic information:

1. Introduction
2. Projects Implemented During Calendar Year
3. Summary of On-Going or Cyclical Monitoring Activities and Results
4. Successes in Reaching Treatment Objectives and Meeting Requirements
5. Difficulties in Reaching Treatment Objectives and Meeting Requirements
6. Recommendations for Changes in Future Efforts to Increase Success

INTRODUCTION

Vegetation management is the practice of removing or modifying live and dead vegetation to reduce the potential spread of wildland fire ignitions, overall rates of wildland fire spread, flame lengths, and catastrophic fire severity. Vegetation management can be used to reduce dead fuels in areas affected by diseases, such as sudden oak death, remove stands of invasive weeds, and remove overly dense vegetation to improve ecological health and reduce competition with native plants that suppresses healthy plant growth. Vegetation management may also aid in the following:

- Reduction of ecological resource impacts from forest disease, invasive species, and wildland fire;
- Maintenance of emergency response and evacuation access roads;
- Minimization of rehabilitation needs associated with fire suppression activities; and/or
- Suppression of fires.

For Midpen, vegetation management for fuels reduction is a complex process that helps further mission-driven ecological resource goals. The best approach for managing fire risk and reducing fuel loads using non-fire vegetation management methods (i.e., without using prescribed burning) on Midpen lands is to focus active management in areas that are affected by disease infestations and/or heavy, dense vegetation, as well as near potential ignition sources, including along roads and in areas adjacent to critical infrastructure.

METHOD OF PRIORITIZING THE ESTABLISHMENT OF NEW VEGETATION MANAGEMENT AREAS

The creation of new Vegetation Management Areas is based on the prioritization of selected locations within District-managed lands. The methodology for locating and prioritizing areas for management was developed by staff with extensive outreach to partner fire agencies and approved by the Board.

In discussions with the Natural Resources Department during the implementation phase of the WFRP, two recommendations were developed regarding the prioritization of Fuel Reduction Area (FRA): updating the definition of a Fuel Reduction Area and including an additional criterion for prioritization.

As part of this annual report, Midpen staff recommends defining Fuel Reduction Areas (FRAs) as native forests or woodland areas of **at least 1 acre in size** (originally 100 acres). Conducting fuel reduction within sensitive natural communities requires the treatment of much smaller areas to avoid where sensitive or rare plants occur. New fine-scale vegetation maps have been recently produced that

include District lands. These maps identify sensitive natural communities at a finer scale that can inform fuel reduction prescriptions for much smaller acreages than originally expected to avoid sensitive resources present in the larger surrounding area.

In addition, Midpen staff recommend the addition of a new prioritization criterion for FRAs. The recommendation is based on findings from the Science Advisory Panel and on new modeling efforts on climate change. Identifying, protecting, and managing “areas [that are] relatively buffered from contemporary climate change over time will enable the persistence of valued physical, ecological, and socio-cultural resources” (Morelli, et. al., 2016¹²). Adding a new criterion that helps improve climate resiliency for local wildlife is an important conservation measure to combat the effects of climate change.

Proposed changes to locating and prioritizing new vegetation management areas are shown in ~~strike~~ and underline below.

ECOSYSTEM RESILIENCY (FOREST HEALTH/FUEL REDUCTION AREAS)

Fuel Reduction Area (FRA) treatments are typically implemented to achieve a combination of habitat enhancement and wildland fire risk reduction. Fuel ladders and surface fuels are greatly reduced in FRAs, and overstory and understory vegetation is spatially separated so that a ground fire will not, under normal fire conditions, burn too hot and/or climb into the canopy and turn into a crown fire.

METHODOLOGY FOR LOCATING POTENTIAL FUEL REDUCTION AREAS FOR ECOSYSTEM RESILIENCY

The location of new FRAs on Midpen lands are confined to native forests or woodland areas of at least ~~100~~ acres in size. Areas classified as “water” or “wetland” are excluded from treatment. Ecosystem health and condition factor into the location of new FRAs. FRAs will be identified by Midpen or other professional fire management or vegetation management staff as important areas for ecosystem health and resiliency.

METHODOLOGY FOR PRIORITIZING FUEL REDUCTION AREAS

Prioritization is established by assigning points for each of the following factors. The areas with the most points receive the highest priority ranking.

- Areas within 300 feet of sensitive natural resources (e.g., rare, threatened and/or endangered species; degraded habitats due to invasive species) that would benefit from and/or respond favorably to treatment;
- Areas within high fire risk areas;
- Areas within 500 feet of locations designated as having mortality due to forest disease, such as SOD;
- Areas identified by professional Midpen or vegetation management staff as important fuel treatment areas for ecosystem resiliency, including but not limited to: – High road density – Topography (such as slope and aspect, especially box canyons);
- Areas where past land use history (e.g., timber harvesting) has increased the number of trees per acre to unnatural conditions;
- Areas identified for prescribed fire for natural resource benefits;

¹² Morelli TL, Daly C, Dobrowski SZ, Dulen DM, Ebersole JL, Jackson ST, et al. (2016) Managing Climate Change Refugia for Climate Adaptation. PLoS ONE 11(8): e0159909. <https://doi.org/10.1371/journal.pone.0159909>

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- Treatments that promote late-seral habitat conditions; and
- Sites experiencing vegetation encroachment that is changing the fuel regime or converting the vegetation type.
- Areas designated within or near climate refugia or areas that may experience exacerbated vegetation changes due to climate change.

ENHANCED FIRE MANAGEMENT

Enhanced fire management treatment allows for the safer passage of the public out of and responding emergency agency into active emergency areas. Treatment is done at a higher level of fuel reduction than that of natural area treatment for forest health.

Fuelbreaks are linear strips of land where trees, vegetation, and dead material have been reduced or removed. These areas can slow the spread of a wildland fire. Fuelbreaks also provide firefighters with zones to take a stand against or control the spread of a wildland fire, or retreat from fire if the need arises. Typically, fuelbreaks are strategically located based on many factors including terrain, existing roads, at risk communities, critical infrastructure, presence of potential ignition sources, fire management logistics areas, evacuation routes, target hazards, and sensitive resources.

Fuelbreaks function as potential anchor points to control lower intensity fires, flank higher intensity fires, and provide firefighter safety. Vegetation is managed to reduce the continuity of live and dead fuels both horizontally and vertically in fuelbreaks. It should be noted that fuelbreaks typically do not stop fires without fire department response and fires may still jump a fuelbreak regardless of fuelbreak size during extreme fire weather, intense fire behavior, or other confounding scenarios.

METHODOLOGY FOR LOCATING POTENTIAL VMAS FOR ENHANCED FIRE MANAGEMENT

Midpen uses criteria to delineate vegetation management areas with a focus on ecosystem resiliency and reduction of catastrophic fire risk.

Potential new VMAs on Midpen lands will be located using the following criteria:

- Areas that enhance and facilitate fire suppression activities (e.g., fire management locations, disclines) and ingress/egress safety for fire responding agencies, their personnel, and fire suppression equipment;
- Adjacent to or near existing or planned fuel treatment areas as identified by fire agencies;
- Identified by state or local fire management agency professional staff as important areas for fuels treatment;
- Within 10 to 25 feet (depending on flame length) of primary Midpen-designated emergency access roads accessible by a Wildland Type 3 fire engine;
- Within 100 feet from existing Midpen structures;
- Within 200 feet from emergency response infrastructure (communications tower, fire station, medivac location, water tank);
- Within 200 feet from a state or local fire management agency-designated expanded fire response/fire monitoring clearing zone (parking area, staging area, landing zone);
- Within 200 feet of Midpen employee-identified sensitive resources or other Midpen High Value Asset that would benefit from and/or respond favorably to treatment or may be at risk of loss in the event of a wildland fire;
- Within 200 feet of a state or local fire agency-designated Midpen evacuation route; and
- Within 300 feet from target hazards (school, hospital, nursing home).

METHODOLOGY FOR PRIORITIZING VMAS

Prioritization of VMAs is established by assigning points for each of the following factors¹³. The areas with the most points receive the highest priority ranking.

- Within 100 feet of Midpen structures;
- Within 200 feet of sites designated as having SOD outbreaks;
- Within 300 feet of target hazards (schools, hospitals, nursing homes);
- Within 300 feet of designated Midpen evacuation routes;
- Within 300 feet of critical emergency response infrastructure (communications tower, fire station, medivac location, pre-planned Incident Command Post, water tank);
- Within 300 feet of Midpen-designated fire response/fire monitoring clearing zones (parking area, staging area, landing zones);
- Within 300 feet of sensitive natural resources that would benefit from and/or respond favorably to treatment;
- Within 300 feet of other high value Midpen assets or potential treatment areas identified by Midpen employees;
- Within high fire risk areas – i.e., CAL FIRE Very High;
- Within 500 feet of current and planned fuel management treatments (including strategic regional fuelbreaks and cooperative efforts with neighboring property owners);
- Within 1,000 feet of current and planned fuel management treatments; and
- Vegetation treatments identified in the field by professional fire staff.

PROJECTS IMPLEMENTED DURING THE CALENDAR YEAR

This section identifies the projects under the Wildland Fire Resiliency Program that were implemented in 2021, including location, open space preserve, methods used, work force, equipment used, herbicide used, acreage treated, etc.

- Expanded fuel reduction around the vicinity of the Skyline Ridge parking area. Reduction was performed mechanically using compact skid-steer loader with horizontal shaft masticating head and hand crews. A total of 14 Acres were treated. Work was performed to create a temporary refuge for visitors as well as a staging area for emergency equipment in the case of a wildfire. The work was partially funded by a SCC Wildfire & Forest Health Wildland Fire Resiliency grant.
- Within Rancho San Antonio Open Space Preserve, two projects were completed. Approximately 3 acres were treated for fuel reduction and invasive weed removal adjacent to the Mora Trail/Ravensbury area. At Deer Hollow Farm, 8 acres were treated for fuel reduction, invasive weed removal, and defensible space clearing near the structures.
- At the Pulgas Ridge Preserve, fuel reduction and invasive weed removal was carried out along the eastern boundary of the preserve on approximately 8 acres.
- A total of 11 acres were treated at the Skyline Ridge main parking lot.
- At the Monte Bello main parking lot 12 hours of hand clearing around oaks and 12 hours of masticator time was conducted.
- Woodside Fire Protection District performed minor maintenance work in the fuel reduction site at the top of Summit Springs Road in Teague Hill. About 13 acres received additional clearing

¹³ VMAs that are currently in the Conservation Grazing Program will be reduced by 1 point recognizing the beneficial reduction of fuel loads that already occurs through conservation grazing activities.

of exotic plants and removal of additional dead trees and brush. Additional work is planned for 2022.

SUMMARY OF ON-GOING OR CYCLICAL MONITORING ACTIVITIES AND RESULTS

This section describes any additional long-term, regional, district-wide, or other monitoring effort or program not related to a specific activity or project.

SUDDEN OAK DEATH

Midpen's work to address Sudden Oak Death (SOD) is completed through a partnership with the SODMAP Project, which is a partnership of scientists and citizens, working together to create the most complete distribution map of a forest disease ever produced in North America. SODMAP incorporates laboratory confirmed collections of plant and water samples from 2005 to the present. It includes both SOD-positive as well as SOD-negative specimens to better illustrate the range and distribution of the disease.

SODMAP is the result of a collaboration between hundreds of citizen scientists participating each year in the [SOD Blitzes](#) organized by the U.C. Berkeley Forest Pathology and Mycology Laboratory, other research organizations, and government facilities.

SUMMARY OF HERBICIDE USE

No herbicide was used for these tasks in 2020 or 2021 under the Wildland Fire EIR.

SUCCESSSES IN REACHING TREATMENT OBJECTIVES AND MEETING REQUIREMENTS

The Prop 68 funded fuel reduction project in Coal Creek met its project objectives by reducing understory brush and removing trees up to 12 inches in diameter within 50 to 100 feet of the edges of the road around the nearby private community.

The Woodside Fire District fuel reduction work in Teague Hill met its fuel reduction objectives by removing understory brush and small trees up to 12 inches in diameter.

Annual maintenance of fuel reduction projects such as disc lines, mowing of pre-existing fuel breaks, defensible space, and landing zones was completed.

In 2021, staff time was invested to collaborate with the Los Altos Hills Fire District on planning for a new regional fuel break connection in Rancho San Antonio Preserve. Work on the ground is expected to begin in 2023.

DIFFICULTIES IN REACHING TREATMENT OBJECTIVES AND MEETING REQUIREMENTS

Midpen has an opportunity to improve "ecological sensitivity" protection measures by refining the granularity of onsite flagging to mark areas of concern in concert with greater oversight of the contracted labor force to further protect sensitive resources. In the summer of 2022, Midpen developed a standard operating procedure for the flagging of resource management concerns as a resource protection measure. Implementation can also be improved by addressing invasive plant species concerns far in advance of fuel reduction implementation work. Most fuel vegetation treatment sites need significant follow-up maintenance work to manage the anticipated regrowth of native plant communities and control invasive plant growth in the long run. In addition, increased efficiencies are

anticipated as Midpen streamlines the contracting procedures for forest health and wildfire treatment services.

Coordinating fuel reduction that is initiated by other agencies brought challenges with maintaining a high level of communication and managing the work details. The addition of a Field Resource Specialist position should help in communicating work plans and Midpen requirements with other agencies.

RECOMMENDATIONS FOR CHANGES IN FUTURE EFFORTS TO INCREASE SUCCESS

Future efforts to increase program success include identifying and incorporating new equipment. In 2023, two critical pieces of equipment are planned, a Robomax remote controlled masticator, and a track mounted chipper. These pieces of equipment will increase efficiency and allow staff to implement program work in terrain that has been traditionally difficult to access. However, sharing this equipment between two field offices limits how much either crew can accomplish.

Land and Facilities staff who are designated to conduct vegetation management has increased in the last two years. However, as program work increases and treated sites enter the maintenance phase, there will be a need for additional Land and Facilities staffing to ensure continued program success and achieve annual target goals.

Detailed resource protection requirements sometimes get lost in the communication and oversight with on-the-ground work crews. The hiring of additional staff to support the fuel reduction program will be a substantial benefit to properly oversee the work by contractors and outside agencies. Additional coordination will be needed as maintenance requirements and acreage increase for fuel reduction sites.

MISCELLANEOUS PROJECTS NOT COVERED UNDER PROGRAMS

The three programs discussed above account for the vast majority of vegetation work District-wide. Other projects that require vegetation work are scoped and approved by other plans and require separate CEQA documentation. They are discussed here to provide a fuller picture of the District work to protect and restore the natural environment.

SUMMARY OF WEEDING ACTIVITIES

Method	2020	2021
Brush-cut / Mow	9	68
Cut	100	28
Dig	97	230
Herbicide	8	97
Pull	499	418
Grand Total	712	840

Year	Species Treated	Cal-IPC Rating				CDFA Rated	Alert	State Noxious Weed	Federal Noxious Weed
		Watch	Limited	Moderate	High				
2020	38	0	7	14	4	6	1	1	0
2021	27	1	8	9	4	6	1	1	0

MITIGATION FOR CAPITAL PROJECTS (PUBLIC ACCESS)

Bear Creek Redwoods Tree Farm Mitigation Site, Bear Creek Redwoods, 2019

Direct-seeded tree basins were planted to mitigate for tree removals associated with the Bear Creek Redwoods parking lot. Performance criteria for the county mitigation requirements has been met. Performance criteria for CDFW mitigation requirements are ongoing and slated to be completed by 2024.

Mud Lake Mitigation Site, Bear Creek Redwoods, 2019-2020

Nursery grown shrubs, vines, and direct-seeded tree basins were planted at two locations adjacent to Upper Lake at Bear Creek Redwoods Preserve to mitigate for impacts to vegetation associated with the Mud Lake Improvements Project. Additional direct-seeded tree basins were installed offsite at the Bear Creek Redwoods Tree Farm Mitigation Site. Performance criteria for permit mitigation requirements are ongoing and slated to be completed by 2024.

Upper Lake Mitigation Site, Bear Creek Redwoods, 2022

Nursery grown vines and wetland plugs were planted at Upper Lake to mitigate for impacts to vegetation associated with the Upper Lake Enhancement Project. Performance criteria for permit mitigation requirements are ongoing and slated to be completed by 2027.

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Webb Creek Bridge Replacement Mitigation Site, Bear Creek Redwoods, 2018

Nursery grown perennials, shrubs, and trees were planted at the Webb Creek Bridge Replacement Project Site to mitigate for impacts to vegetation associated with the project. Performance criteria for permit mitigation requirements are ongoing and slated to be completed by 2023.

Madonna Creek Ranch Restoration Mitigation Site, Miramontes Ridge, 2021

Willow stakes were planted to restore vegetation at the Madonna Creek Ranch Dump Clean-Up Site. Performance criteria for permit mitigation requirements is ongoing and slated to be completed in 2023.

Stevens Creek Nature Trail Bridges Mitigation Site, Monte Bello, 2020

Nursery grown perennials, shrubs, and trees were planted to mitigate for impacts to vegetation that occurred during the construction of two bridges along the Stevens Creek Nature Trail. Performance criteria for permit mitigation requirements is ongoing and slated to be completed by 2028.

Harkins Bridge Mitigation Site, Purisima Creek Redwoods, 2019

Willow stakes and nursery grown perennials, shrubs, and trees were planted at the Harkins Bridge Replacement Project Site to mitigate for impacts to vegetation that occurred during bridge removal and replacement activities. Performance criteria for permit mitigation requirements are ongoing and slated to be completed by 2024.

Ravenswood Bay Trail Connection Project Mitigation Site, Ravenswood, 2019

Nursery grown grasses, perennials, and shrubs were planted along the Ravenswood Bay Trail to mitigate for impacts that occurred during implementation of the Ravenswood Bay Trail Connection Project. Performance criteria for permit mitigation requirements are ongoing and slated to be completed by 2024.

Mindego Ponds Enhancement Mitigation Site, Russian Ridge, 2020

Salvaged wetland plugs were planted to restore vegetation at the Mindego Ponds Enhancement Project at Kneudler Lake. Performance criteria for permit mitigation requirements is ongoing and slated to be completed in 2023.

Hendry Creek Mitigation Site, Sierra Azul, 2018-2019

Nursery grown perennials, shrubs, and trees were planted to mitigate for shrub and tree removals that occurred during site restoration activities. Performance criteria for permit mitigation requirements are ongoing and slated to be completed by 2023 if permit performance criteria are met.

Mt. Umunhum Trail Bridges Mitigation, Sierra Azul, 2016-2017

Direct-seeded tree basins and nursery grown perennials and shrubs were planted along the Mt. Umunhum Trail and at an offsite mitigation site along the Woods Trail to mitigate for the removal of trees during the installation of three bridges along the Mt. Umunhum Trail. Performance criteria for permit mitigation requirements are ongoing and slated to be completed by 2022.

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Mt. Umunhum Summit, Sierra Azul, 2017-2020

Nursery grown perennials, shrubs, and trees were planted to restore the vegetation at the Mt. Umunhum Summit. Performance criteria outlined in the Mt. Umunhum Summit Vegetation Restoration Plan is ongoing and slated to be completed by 2027.

LIST OF PREPARERS

Name	Title	Department	Report
Sifuentes-Winter, Coty	Senior Resource Management Specialist	Natural Resources	Conservation Grazing
			IPM Program
			Wildland Fire Resiliency Program
Andersen, Julie	Senior Resource Management Specialist	Natural Resources	IPM Program
Bonner, Christian	Field Resource Specialist	Land & Facilities	Wildland Fire Resiliency Program
Beckman, Craig	Skyline Area Manager	Land & Facilities	Wildland Fire Resiliency Program
Chung, Jean	Property Management Specialist II	Land & Facilities	IPM Program
Correa, Sean	Ecologist III	Natural Resources	IPM Program
Gartside, Ellen	Foothills Volunteer Program Lead	Visitor Services	IPM Program
Gorman, Michael	Foothills Area Manager	Land & Facilities	Wildland Fire Resiliency Program
Greig, Nathan	Sr. Technologist	Information, Science, and Technology	Conservation Grazing
			IPM Program
			Wildland Fire Resiliency Program
Holback, John	Field Resource Specialist	Land & Facilities	IPM Program
			Wildland Fire Resiliency Program
Mackessy, Joe	Facilities Maintenance Supervisor	Land & Facilities	IPM Program
Mills, Amanda	Resource Management Specialist II	Natural Resources	Miscellaneous Projects
Nuri, Arianna	Ecologist I	Natural Resources	Wildland Fire Resiliency Program
Reed, Lewis	Resource Management Specialist II	Natural Resources	Conservation Grazing
Tokatlian, Karine	Resource Management Specialist II	Natural Resources	IPM Program
Williams, Jennifer	Volunteer Program Manager	Visitor Services	IPM Program