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GIS205
Final Project
CPW Parks Invasive Plant Treatment Tracking

Use Case, Technical Architecture, and Mockup Documentation

Contents

Use Case

Audience

CPW State Park Managers, CPW State Park Resources Technicians, weed management contractors engaged by the parks, CPW Natural Resource Stewardship office staff

Audience Size

126-200

Application Needs

1. Easily locate park of interest - search
2. View existing invasive plant treatment data
    a. Easily distinguish different treatment types at a glance – symbology
    b. View details of treatment record – inspect attributes via popup

3. Inspect context of treatment
    a. Spatial context - vegetative community, terrain, water bodies etc. via different background imagery
    b. Invasive plant population context – presence and distribution of invasive plants in the area
    c. Infrastructure/usage context - surrounding park public use facilities, roads, and trails
    d. Map set context – ½ mile index grid that correspond to larger scale/small extent maps
4. Create/edit/delete invasive plant treatment polygon features and attributes – via editor
    a. Create new features and attributes
    b. Edit vertices
    c. Edit attributes

Uses Case 1 - Park Side

This web mapping application will provide the CPW State Park staff and third parties engaged by the Park in invasive plant management with the following benefits:

Park managers, technicians, and contractors will be able to:

1. For record keeping purposes, view weed treatment area polygons and information about
    a. Park Name
    b. Year: of application
    c. Month: of application
    d. Day: of application
    e. Applicator Name
    f. Contractor
    g. Contractor
    h. Contractor Email
    i. Contractor Phone
    j. Treatment Method
    k. Target Species
    l. Application Pattern
    m. Equipment Used
    n. Primary Herbicide Chemical
    o. Primary Herbicide Brand Name
    p. Primary Herbicide Chemical Oz/Acre
    q. Secondary Herbicide Chemical
    r. Secondary Herbicide Brand Name
    s. Secondary Herbicide Chemical Oz Per Acre
    t. EPA Reg Number
    u. Air Temperature
    v. Wind Speed
    w. Comments
2. Plan future invasive plant management activities to avoid spatial and temporal overlap for legal/herbicide label compliance and efficient use of materials and time.

3. Determine areas where signage should be posted to inform public notification and for interpretation
4. Monitor treated populations for efficacy
5. Investigate potential problems caused by invasive treatment activities (i.e. drift damage, ground disturbance, wildlife harm, etc.).
6. Draw new weed treatment area polygons and input attribute information which will update a web service hosted by the CPW Resource Stewardship office. This will allow for use of record data via a map that does not have to be maintained by park staff.
    a. Park Name
    b. Year: of application
    c. Month: of application
    d. Day: of application
    e. Applicator Name
    f. Contractor
    g. Contractor
    h. Contractor Email
    i. Contractor Phone
    j. Treatment Method
    k. Target Species
    l. Application Pattern
    m. Equipment Used
    n. Primary Herbicide Chemical
    o. Primary Herbicide Brand Name
    p. Primary Herbicide Chemical Oz/Acre
    q. Secondary Herbicide Chemical
    r. Secondary Herbicide Brand Name
    s. Secondary Herbicide Chemical Oz Per Acre
    t. EPA Reg Number
    u. Air Temperature
    v. Wind Speed
    w. Comments

Uses Case 2 – Resource Stewardship Side:

This web mapping application will provide the CPW Resource Stewardship office with the following benefits:

1. Easily communicate with park staff about weed treatments (concerns, feedback, corrections, etc.) due to the ability to view the exact same map/data and real-time changes to said map/data. For example having a phone conversation wherein weed treatment data is discussed and a polygon is reshaped by RS staff member in Denver and it is updated on browser refresh for park staff in Colbran, CO.
2. This will digitize and centralize noxious weed management data which is legally required to be recorded and is currently maintained as paper records at the individual parks.
3. This will allow CORA requests for weed treatment data to be easily handled by Resource Stewardship going forward.

4. The CPW Resource Stewardship office which will host the web map and data via ArcGIS Online wants to harvest information regarding noxious weed treatment activities at each of the 42 state parks managed by CPW.
5. Data collected through the web mapping application will be used by the state parks noxious weed management planning coordinator in determining needed management actions during the drafting of Colorado Noxious Weed Act required management plans for each of the parks.

Technical Architecture

Hosting Location

The application will be hosted on Github Pages at:
https://swilliams1031.github.io/CPW_WeedsTrt_MapServApp/

The code for this application can be viewed on Github at:
https://github.com/swilliams1031/CPW_WeedsTrt_MapServApp

API

ArcGIS API for JavaScript 3.24.

Reasoning: Colorado Parks and Wildlife utilizes ESRI ArcGIS for GIS data management and use and maintains an ArcGIS Online presence to share spatial data. Thus, the ArcGIS API was chosen to allow for seamless integration of existing and future data. Most symbology created using ArcGIS can be published to ArcGIS Online and used with feature services and in mapservices. This allows for consistency between weed management plans and the mapping application. Also, since data will be hosted on ArcGIS Online, any view settings, symbology, or other configuration of the feature layers will be honored by the API allowing for ease of use. Version 3.24 is intended for creating full featured 2D maps, thus was the ideal API version for this application since using a 3D map would have been unnecessary.

Data and Data sources

Data Type	Data	Data Creator	Data Source
Map Service	CPW State Park Invasive Plant Treatment Tracking Map Test	Steve Williams	http://frccbcc.maps.arcgis.com/home/webmap/viewer.html?webmap=8809446956814e65993a7295b328b706
Feature Service (within map service)	CPW Properties (centroid points)	CPW	https://services5.arcgis.com/ttNGmDvKQA7oeDQ3/arcgis/rest/services/CPWAdminData/FeatureServer/13
Feature Service (within map service)	State Park Boundaries (polygons)	Steve Williams	https://services.arcgis.com/YseQBnl2jq0lrUV5/arcgis/rest/services/COParks_WeedTreat_Tracking/FeatureServer/3
Feature Service (within map service)	Halfmile Index Grid (polygons)	Steve Williams	https://services.arcgis.com/YseQBnl2jq0lrUV5/arcgis/rest/services/COParks_WeedTreat_Tracking/FeatureServer/2

Feature Service (within map service)	Invasive Plant Treatment Areas (polygons)	Steve Williams	https://services.arcgis.com/YseQBnl2jq0lrUV5/arcgis/rest/services/COParks_WeedTreat_Tracking/FeatureServer/1
Feature Service (within map service)	Park Facilities (points)	CPW	https://services5.arcgis.com/ttNGmDvKQA7oeDQ3/arcgis/rest/services/CPWAdminData/FeatureServer/0
Feature Service (within map service)	Public Park Roads (lines)	CPW	https://services5.arcgis.com/ttNGmDvKQA7oeDQ3/arcgis/rest/services/CPWAdminData/FeatureServer/1
Feature Service (within map service)	Trail Segments (lines)	CPW	https://services5.arcgis.com/ttNGmDvKQA7oeDQ3/arcgis/rest/services/CPWAdminData/FeatureServer/2
Feature Service (within map service)	Noxious Weeds Points (points)	Steve Williams	https://services.arcgis.com/YseQBnl2jq0lrUV5/arcgis/rest/services/WEEDS_FALSIFIED/FeatureServer/1
Feature Service (within map service)	Noxious Weeds Lines (lines)	Steve Williams	https://services.arcgis.com/YseQBnl2jq0lrUV5/arcgis/rest/services/WEEDS_FALSIFIED/FeatureServer/4
Feature Service (within map service)	Noxious Weeds Polygons (polygons)	Steve Williams	https://services.arcgis.com/YseQBnl2jq0lrUV5/arcgis/rest/services/WEEDS_FALSIFIED/FeatureServer/5

Mockup