# The Economics of Brownfields and Watershed Health In Portland, Oregon

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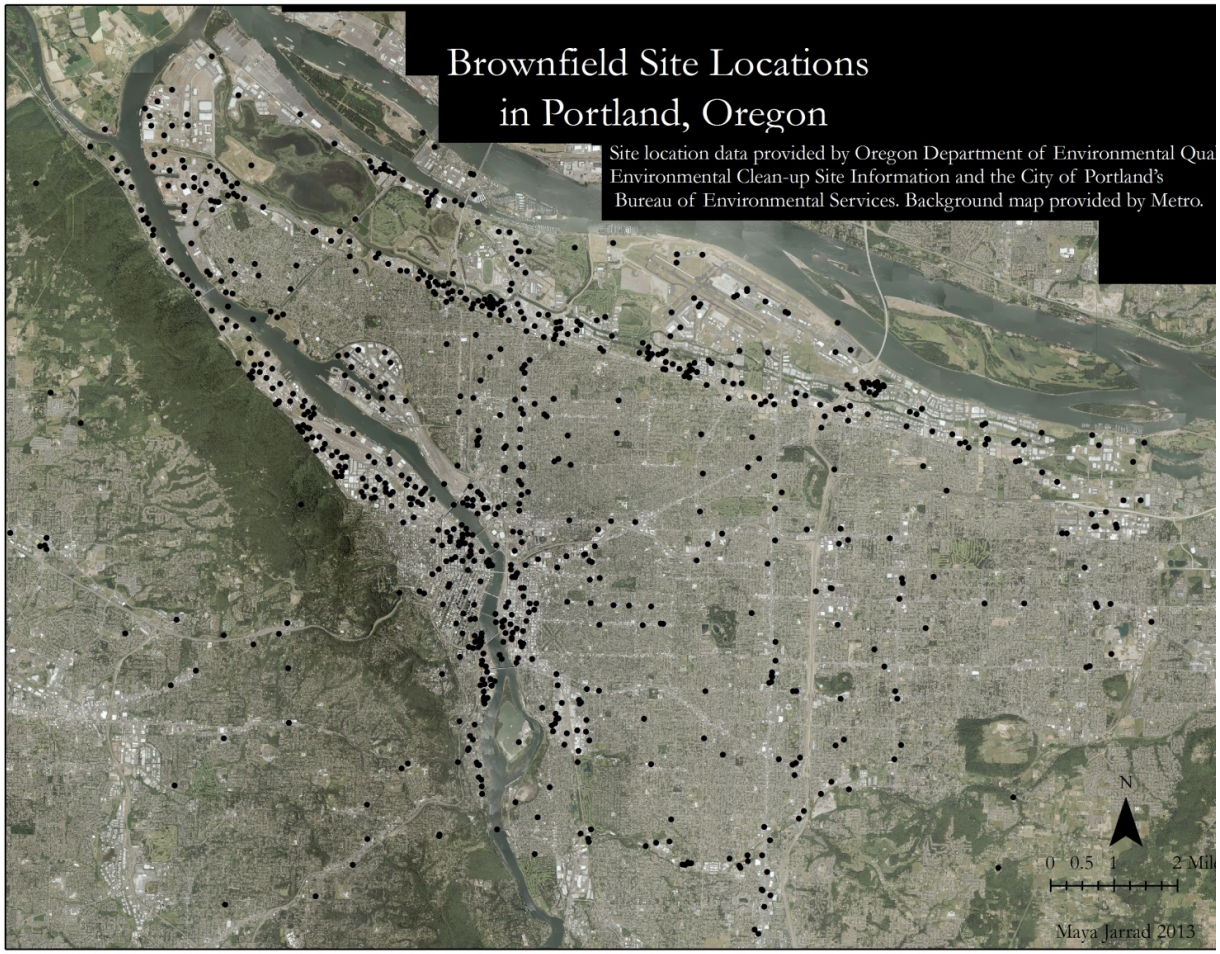
## Executive Summary

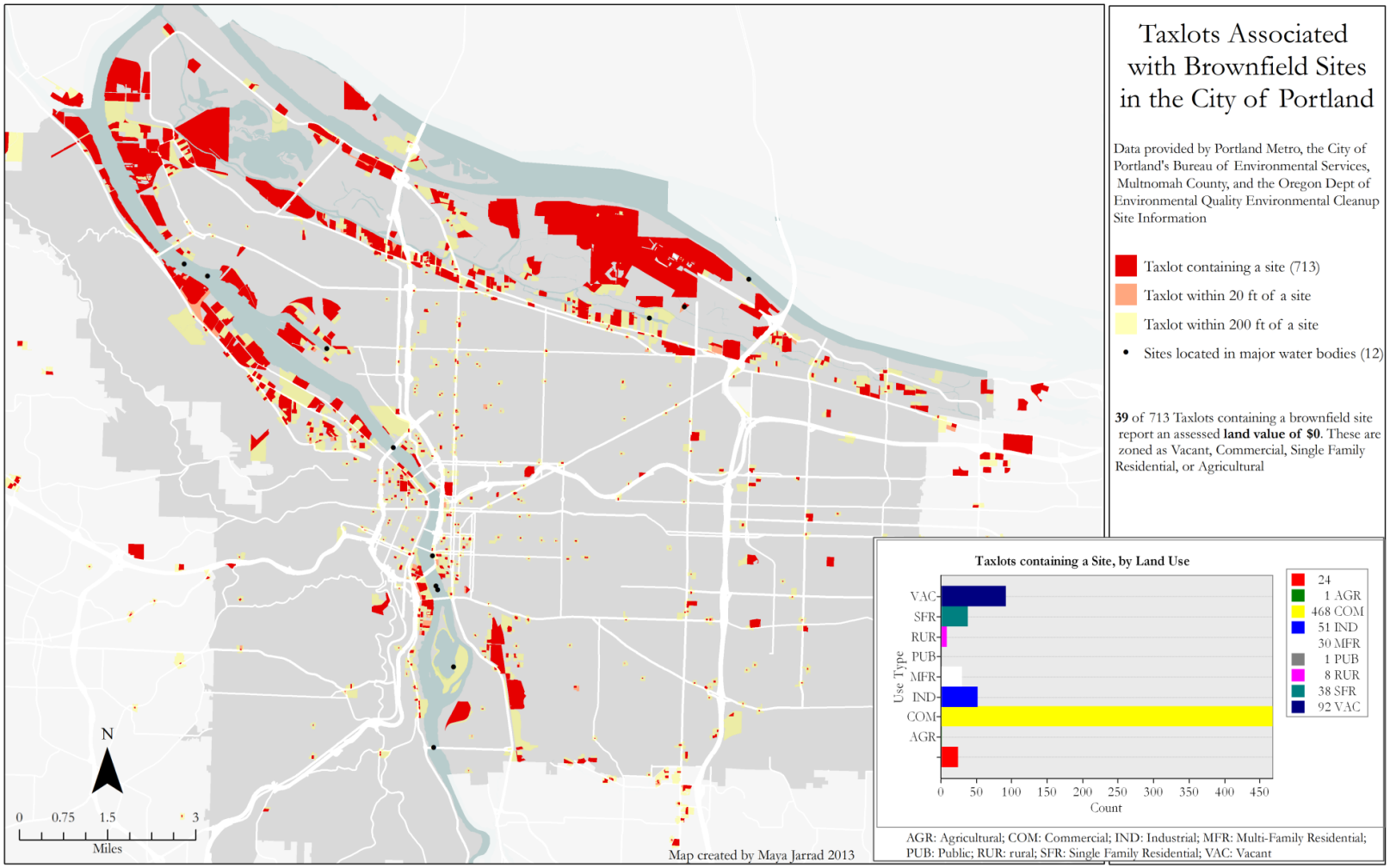
Brownfield remediation is a complex process that involves many different considerations, particularly when considering industrial land use in Portland, Oregon. A comprehensive analysis of a brownfield remediation project should consider the effects on the economic health of the community, on urban watershed health, on carbon emissions, on housing values and other metrics of environmental valuation. In the following report we draw heavily on the literature related to brownfield remediation in the United States and conclude that a paired tax- or subsidy-based incentive might be best to motivate the availability of viable industrial brownfield sites. In addition, we find that local initiatives in touch with municipal policies and community needs continue to produce successful remediation sites by effectively involving local governments.

# 4. Visualizing Brownfields

## 4.1 Brownfields and City Planning

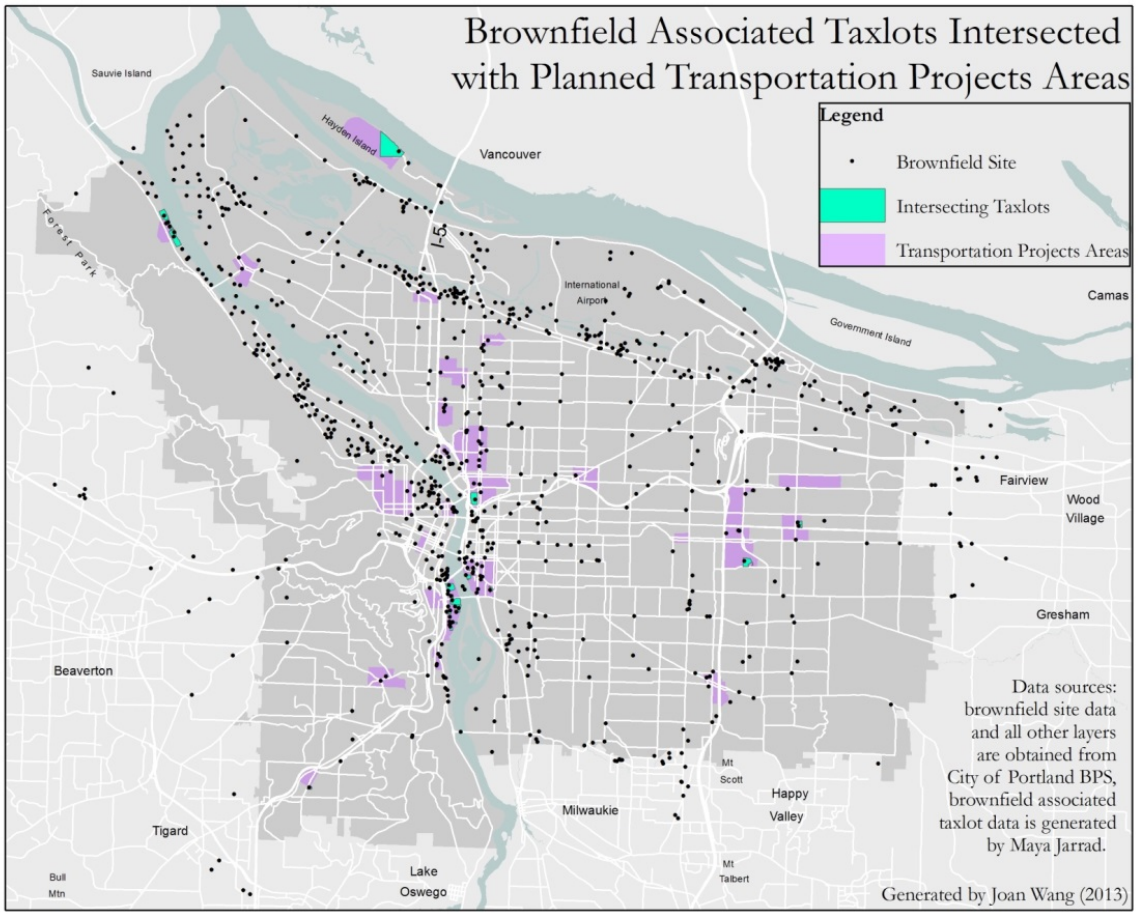



Brownfield Site Locations in Portland, Oregon
Known locations (830) of Environmental Clean-up Sites from the Oregon Department of Environmental Quality (DEQ) are shown as points on a map of Portland, OR, including Superfund sites, residential lots, and areas of major waterways. A large portion of sites are concentrated in the industrial, or previously industrial, areas of the city, and primarily near the Willamette River or in the Columbia River Slough. This map does not show the total area affected by the contamination, but is meant to provide a spatial reference of the spread of sites across the city. Private residence properties may be underrepresented in the dataset due to a lack of information about


Taxlots Associated with Brownfield Sites in the City of Portland
Data provided by Portland Metro, the City of Portland's Bureau of Environmental Services, Multnomah County, and the Oregon Dept of Environmental Quality Environmental Cleanup Site Information
Taxlot containing a site (713)
Taxlot within 20 ft of a site
Taxlot within 200 ft of a site
Sites located in major water bodies (12)
39 of 713 Taxlots containing a brownfield site report an assessed land value of $0. These are zoned as Vacant, Commercial, Single Family Residential, or Agricultural
Taxlots containing a Site, by Land Use
Use Type
VAC
SFR
RUR
PUB
MFR
IND
COM
AGR
0 50 100 150 200 250 300 350 400 450
Count
24
1 AGR
468 COM
51 IND
30 MFR
1 PUB
8 RUR
38 SFR
92 VAC
AGR: Agricultural; COM: Commercial; IND: Industrial; MFR: Multi-Family Residential; PUB: Public; RUR: rural; SFR: Single Family Residential; VAC: Vacant
N
0 0.75 1.5 3
Miles
Map created by Maya Jarrad 2013

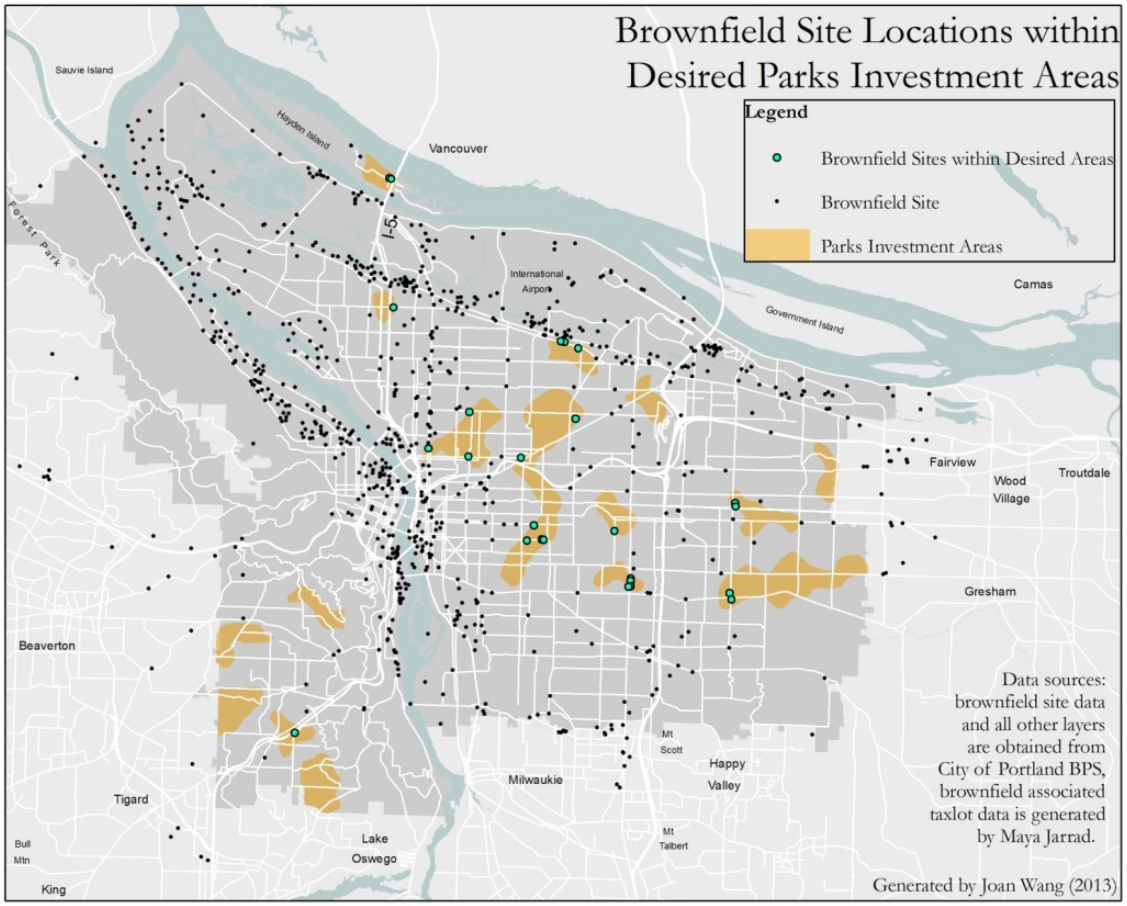
### 4.2 Tax Lots Associated with Brownfield Sites in the City of Portland

In the City of Portland there are 713 brownfield sites spatially located within tax lots (shown in red) of the 830 sites recorded by the Oregon Department of Environmental Quality (DEQ) in the Environmental Cleanup Site Information database. While the vast majority of the tax lots containing a site have an assessed land value greater than $0, some sites may have reduced assessed land values under the Oregon Department of Revenue's administrative rule OAR 150-308.205-(E). The rule dictates that three commonly used appraisal methods are combined when determining real market value of a contaminated site: the sales comparison approach, the cost approach, and the income approach. These approaches capture the cost to "cure" the land, including the environmental audits, surety bonds, insurance, monitoring costs, and engineering and legal fees, as well as the costs directly related to the clean-up of the hazardous material(s); the opportunity cost of governmental restrictions to production; and any fiscal implications, such as the increased cost to insure or finance the property. The tax lot data does not show reductions in the tax levy for each property.

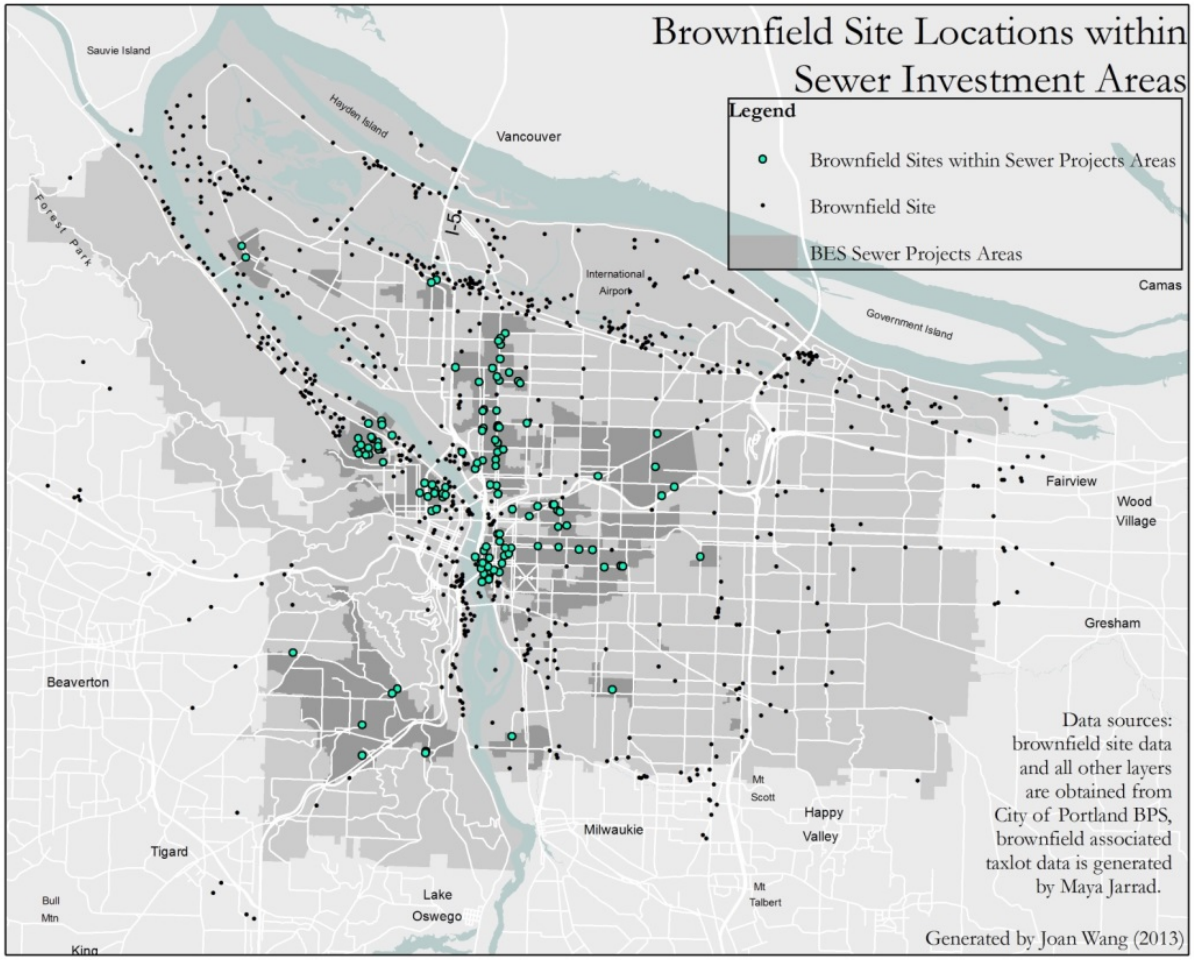



Total: 77 tax lots out of 713.

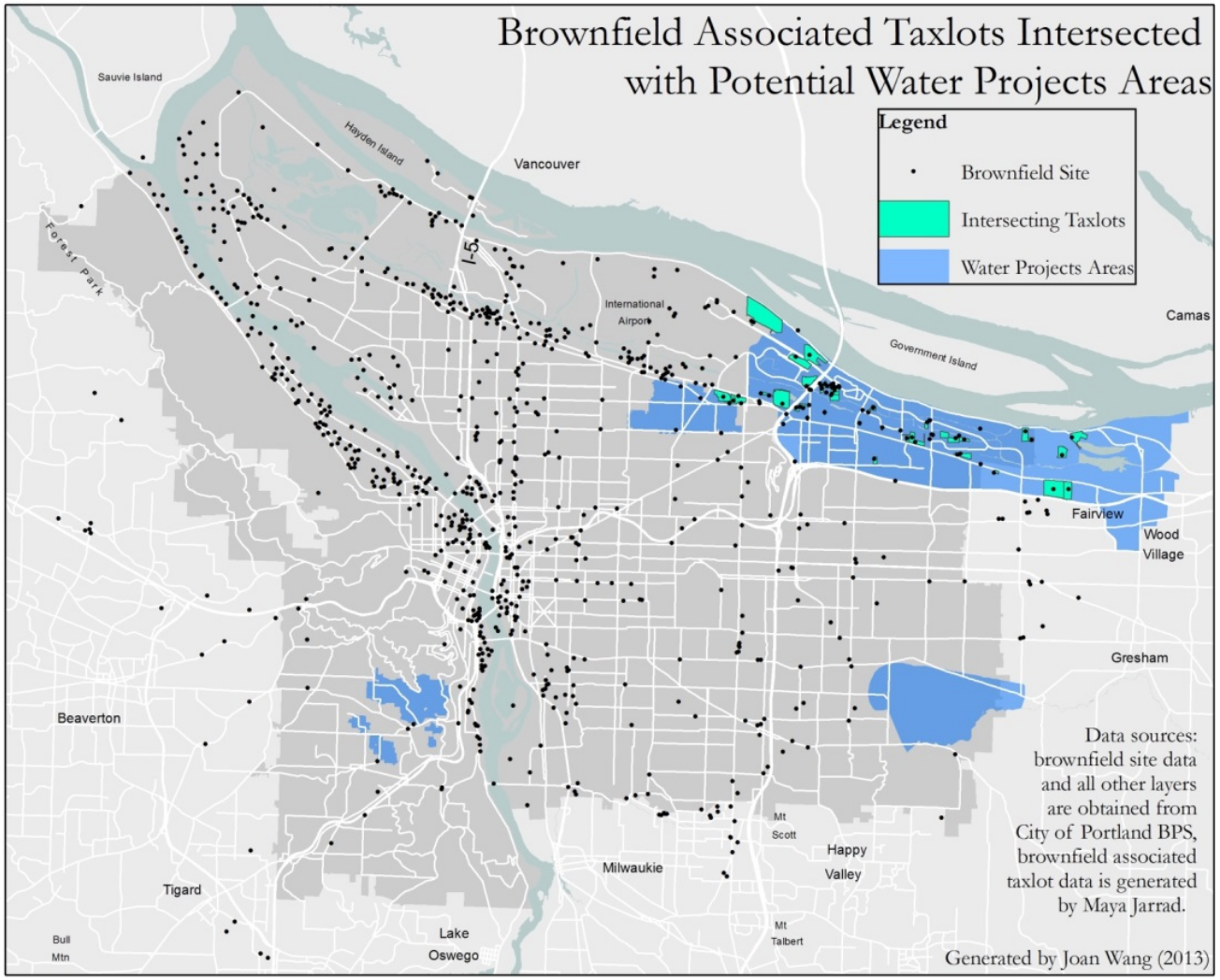
As part of the PDX Comprehensive Plan, the BPS has generated many discussion layers that showcase its plans to improve various aspects of the city in the next 20 years. The proposed improvement and investment projects are laid out in the PDX Comprehensive Plan Discussion Layers. Six of these layers are targeted in this project, each generating a map that conveys how brownfield sites are related to these project areas. The motivation behind the creation of these six maps is to convey how brownfield sites are spatially related to these areas designated for development. This could lead to collaboration between urban planning projects and brownfield redevelopment, which may reduce overall costs. Four of these six maps are in presented in this section; two are presented in the fourth section titled "Brownfields and the Environment."




The discussion layer used "shows desired park, recreation, natural area and trail improvements … [to] fill gaps in the parks and recreation system" (Portland Bureau of Planning and Sustainability 2013).
These highlighted areas are neighborhoods "where residents are more than ½ mile from a developed park or natural area, or more than 3 miles from a full-service community center" (Portland Bureau of Planning and Sustainability 2013) . The areas are sparsely dispersed in the city, as are the 26 brownfields within them.

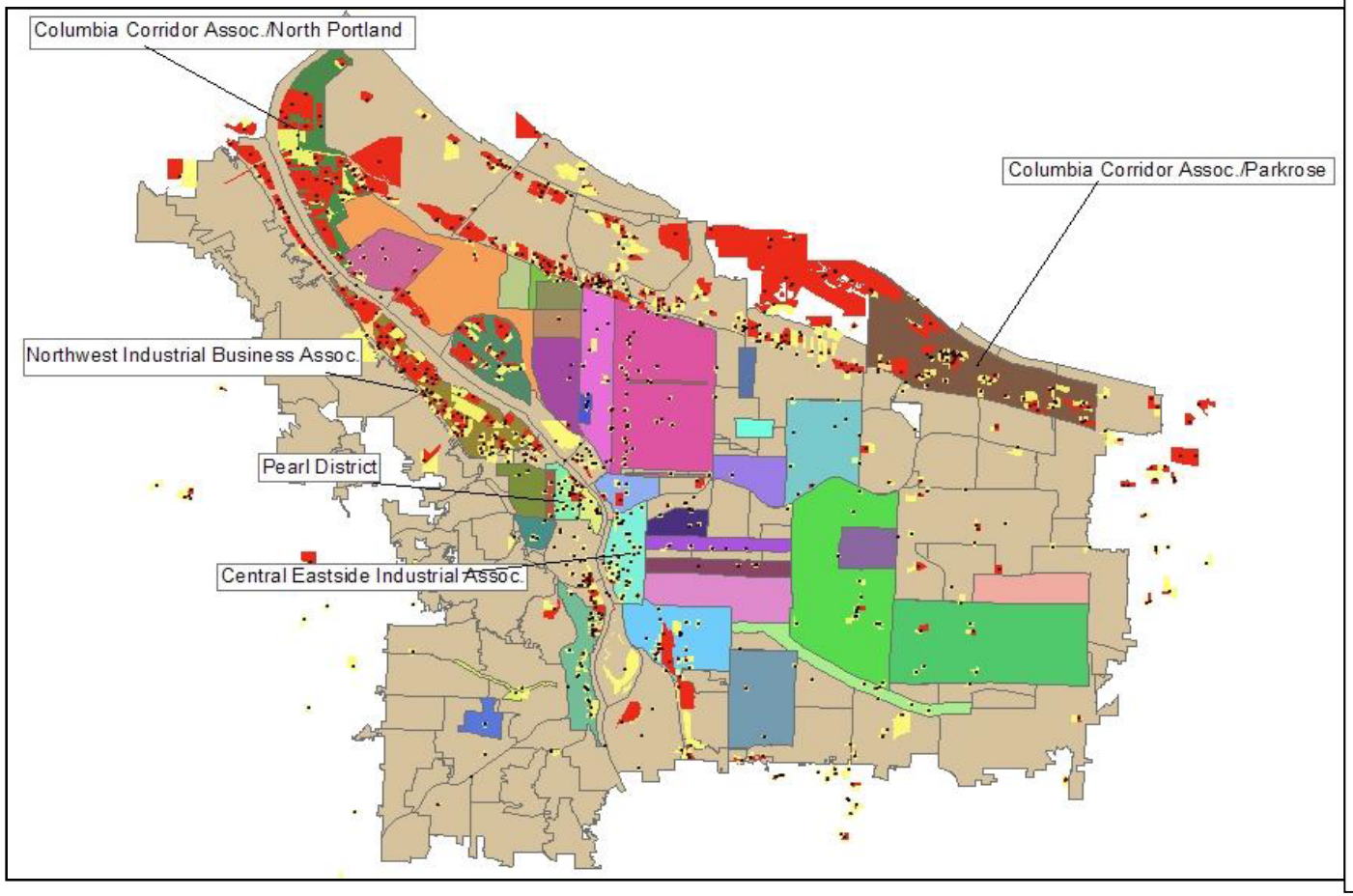



In this map, brownfield sites within the city's sewer investment areas are highlighted. "Major investments in the sewer … systems will ensure they continue to protect public health, water quality and the environment." (Portland Bureau of Planning and Sustainability 2013). This is the case where sewer investments will most likely take place in the future in these designated areas. Therefore, combining brownfield remediation efforts with these investment projects seems very plausible and perhaps more cost-effective. There are 123 selected sites, which amount to about 15% of all sites.




Total: 63 tax lots out of 713

### 4.3 Brownfields and Business




**Legend:**

**Black Dots**: Brownfield Sites
**Colored Polygons**: Business Associations
**Overlaid Red, Orange, and Yellow Areas**: Brownfield and Brownfield-Adjacent Taxlots
**Red**: Brownfield Taxlot
**Orange**: Taxlot with Brownfield within 20ft
**Yellow**: Taxlot with Brownfield within 200ft

**Layers Used**: Brownfield Taxlots, Business Associations, Neighborhoods, City Boundaries; Open GIS Data Initiative, City of Portland
Generated by Chris Weber (2013)

**Figure 4.7.** Brownfield Sites with Business Association Boundaries
Generated by Chris Weber (2013)

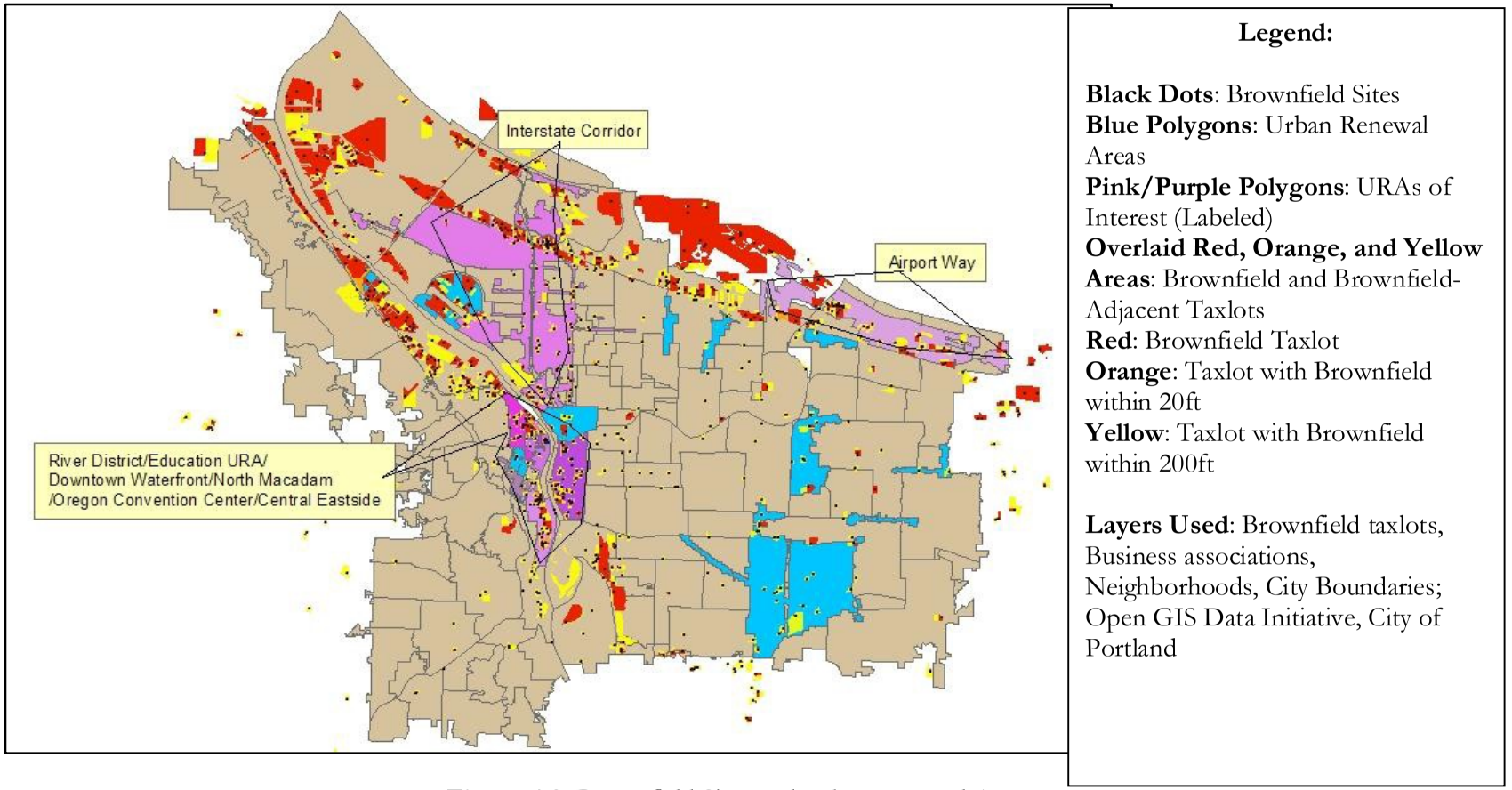



**Figure 4.8:** Brownfield Sites and Urban Renewal Areas
Generated by Chris Weber (2013)

## 4.4 Description of Figures 4.7 and 4.8

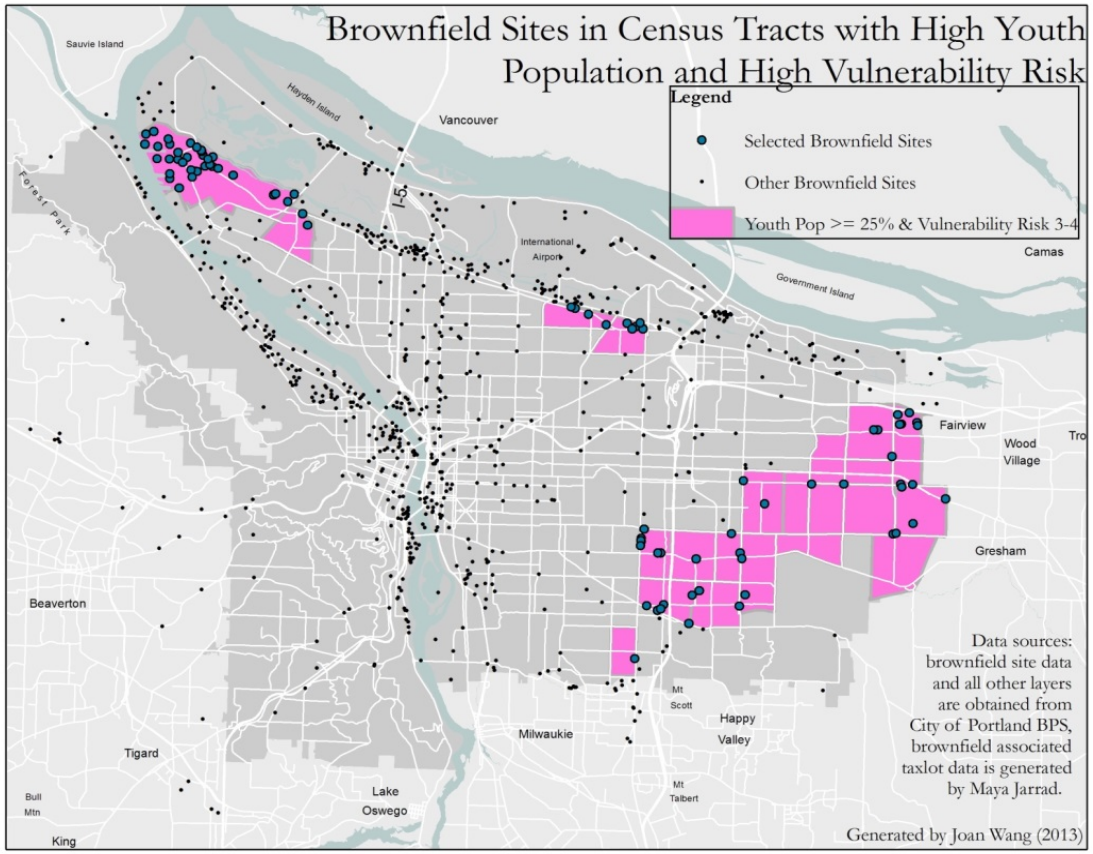
One challenge the push for brownfield development faces is the need to get local business leaders on board. If local businesspeople do not want to invest in redevelopment then it simply will not happen. Therefore, it is important to identify areas where headway would make a real dent in the process of brownfield redevelopment.

Five business association districts have been labeled in Map II.1. These areas all have high concentrations of brownfields and tax lots in the vicinity of brownfields. These areas would be tremendous places to start pushing for policy from a political standpoint. Policy-making is about access points; here are ours. Some of these areas also have urban renewal projects underway. This could be an advantage as that means that these areas are already in the process of improvement. Convincing local business leaders to encourage brownfield owners to take advantage of benefits offered by the Portland Development Commission by site redevelopment could be a way to overcome some of the "zero assessed value" sites. The Portland Development Commission (PDC) provides special loans through the Commercial Property Redevelopment Loan Program for property owners who incorporate sustainable and green building practices into construction projects; the redevelopment of Brownfield sites would certainly qualify (or perhaps this is another place some work needs to be done).

Of the five business associations highlighted in Map II.1, The Pearl District, Central Eastside Industrial Association, and Columbia Corridor Association/Parkrose areas are of special interest. These associations are in the same place as key urban renewal areas (URAs) that allow for the loan program mentioned above to be used. These URAs are shown in Map II.2. In the central southwest area marked on the map, multiple URAs border each other and have a large amount of brownfield sites. This should be an area of interest for any policymaker. The topic of job creation is one that is discussed alongside the issue of brownfield development. Part of the loan program's goals is to support permanent job growth that reflects the strategic priorities of the PDC, which are reflected in various development plans found on their website. With all of this goes a caveat, however. This possible course of action will likely not work if the development on brownfields is targeted as funding *in addition* to what is available through URA-based programs. From a political standpoint, it may be seen as "double-funding," where a geographic area is bestowed with multiple funding sources that may appear, at least to the public and to local

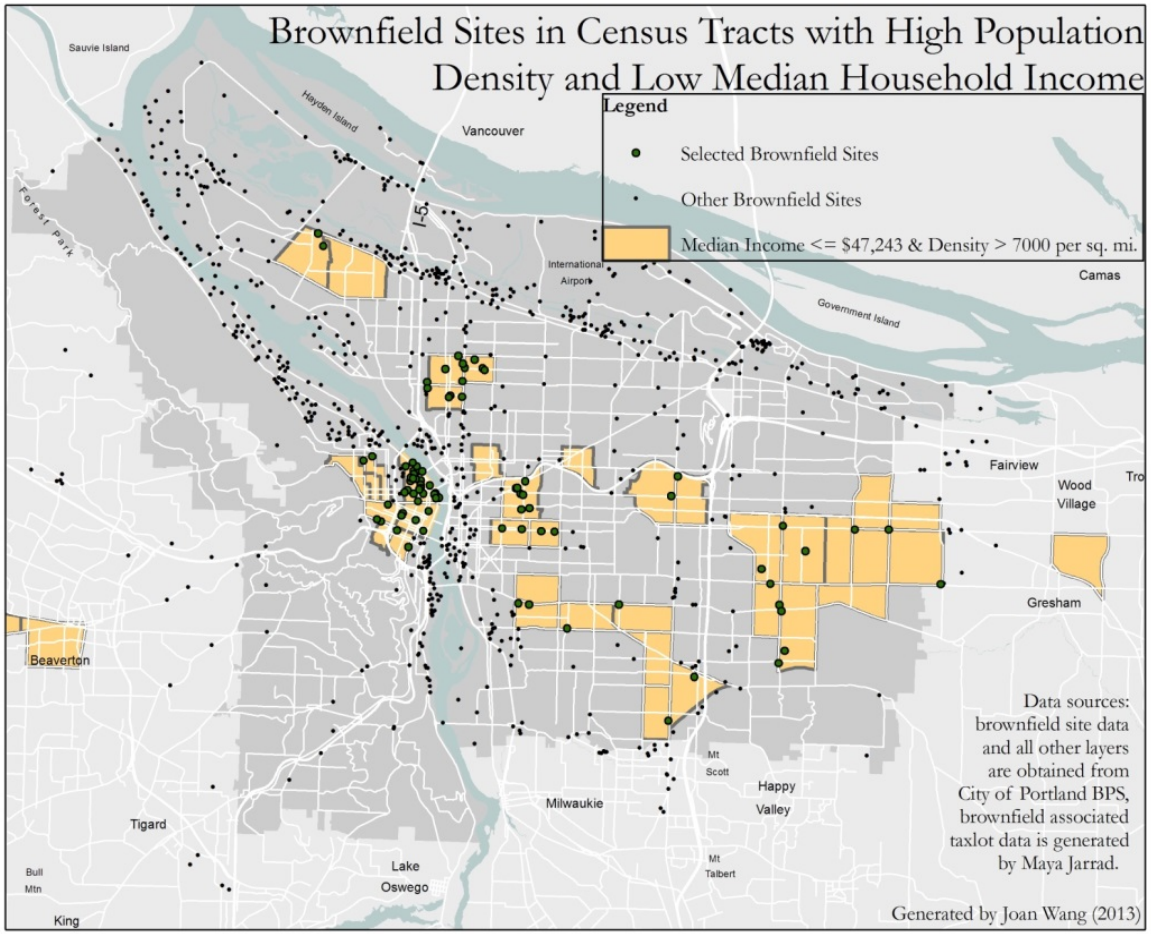
leaders, to be doing the same thing. An expansion of programs already in place in URAs that includes special incentives for brownfield development may be not only appropriate but also extremely effective.

### 4.5 Brownfields and Demography




Residents in neighborhoods with high vulnerability risk and large youth populations are most likely not able to take actions to clean up the brownfields near them. This map shows census tracts with a youth population higher than 25 percent as well as having 3 to 4 out of 4 total vulnerability risk factors. Areas in North Portland, East Portland, and southeast of the airport fit this category. There are 87 out of 830 total brownfield sites (about 10%) are located in these areas. Visually, there is a cluster of brownfield sites in North Portland to the north of Cathedral Park. Brownfield remediation projects could join with Bureau of Environmental Services efforts to clean up the Portland Harbor and provide brownfield free neighborhoods in these vulnerable areas.

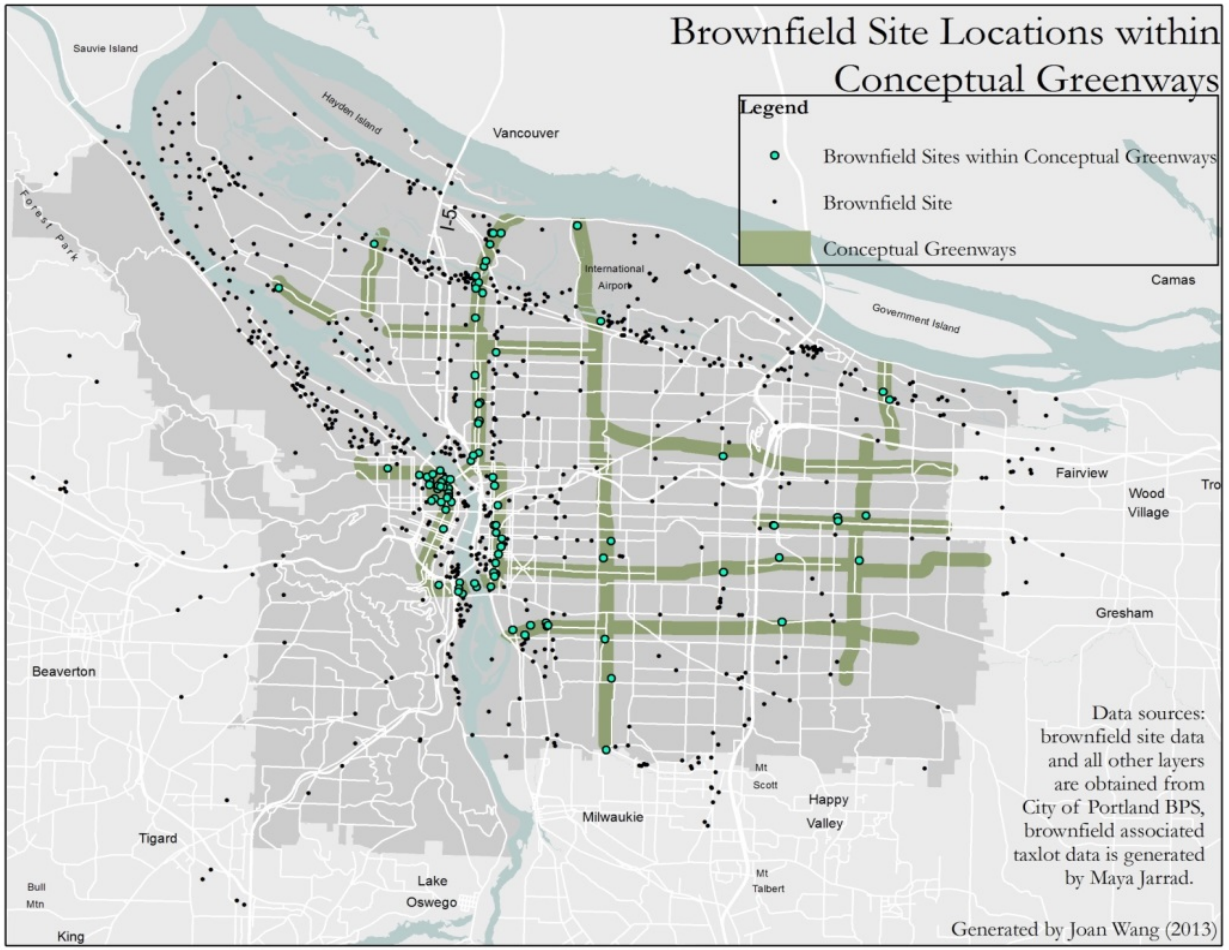
Two layers from the PDX Comprehensive Plan Background Layers are examined: Youth Population and Vulnerable Populations. Youth Population is the "percent of the total population under 18 years of age by 2010 census tract geographies … calculated from U.S. Census Bureau, 2010 Census, Summary File 1, Table P12" (Portland Bureau of Planning and Sustainability 2013). Vulnerable Populations are census tracts that "have higher-than-average populations with characteristics that make resisting displacement more difficult: they are renters rather than homeowners, belong to communities of color, lack college degrees, and have lower incomes. The shades of color correspond with how many of these factors are present in a given census tract" (Portland Bureau of Planning and Sustainability 2013).



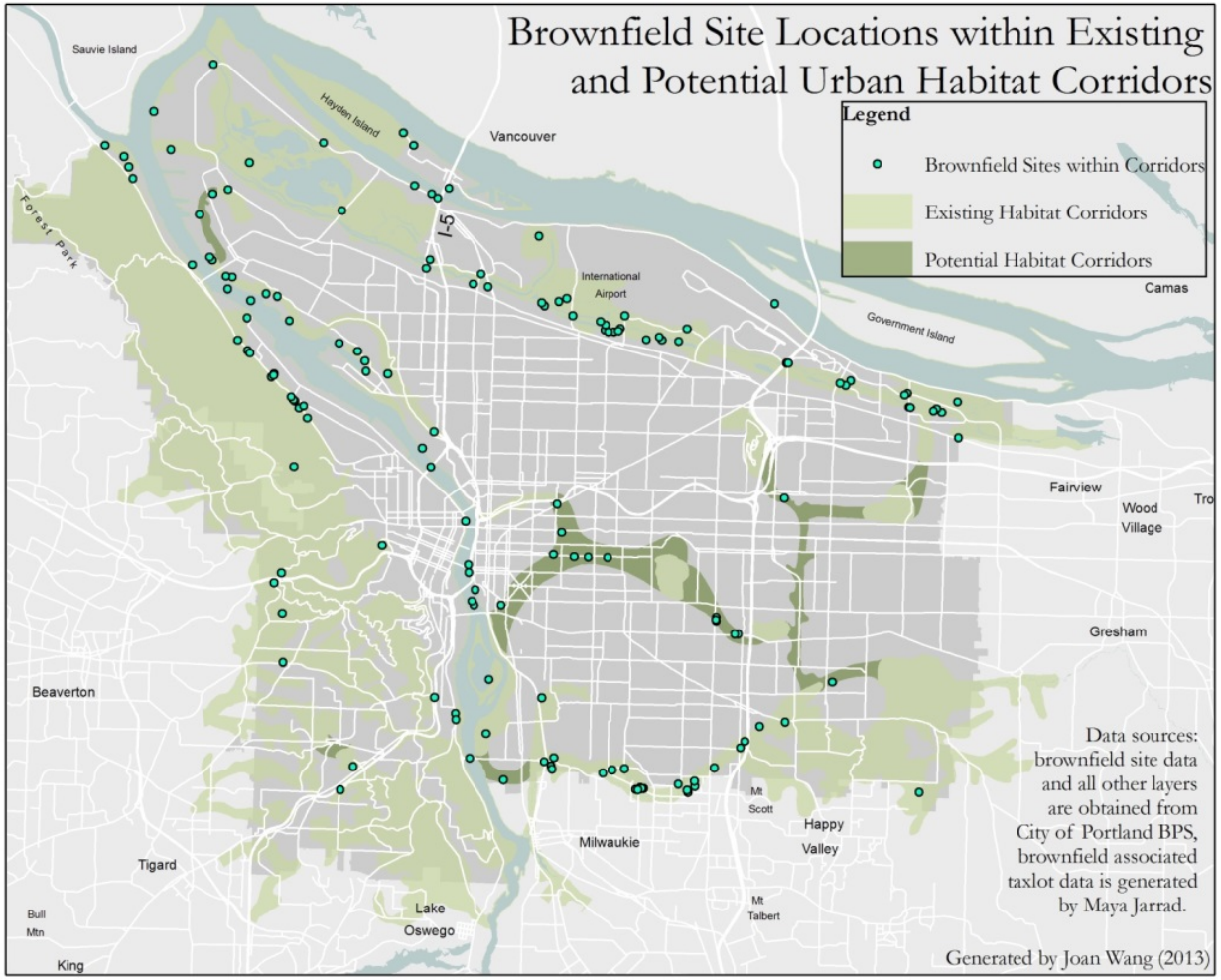

Two layers from the PDX Comprehensive Plan Background Layers are examined: Population Density and Median Income. Population Density is "total population per square mile by 2010 census tract geographies [from] U.S. Census Bureau, 2010 Census, Summary File 1, Table DP-1" (Portland Bureau of Planning and Sustainability 2013). Median Income is median household income in the past 12 months (in 2011 inflation-adjusted dollars) by 2010 census tract geographies [from] U.S. Census Bureau, 2007-2011 American Community Survey, Table B19013" (Portland Bureau of Planning and Sustainability 2013).

This map shows census tracts with more than 7,000 residents per square mile and median household income lower than or equal to $47,243. The threshold for density is selected to include the highest two out of five intervals BPS previously defined for population density. The threshold for median income is used to include the lowest two out of five intervals previously defined by BPS. These areas have a higher rate of residents living near brownfields but are most likely not able to initiate any remediation process. The 84 brownfields present in these selected census tracts are highlighted, which is about 10% of the total number of brownfield sites. There are quite a few sites in areas like Boise with an extremely low-income population. Other than the sites in downtown, most of the sites are scattered in different residential neighborhoods. This calls for further examination of how these sites are affecting neighborhood development. Often, non-profits like Groundwork are needed to at least raise awareness to the issue of brownfields in these neighborhoods.

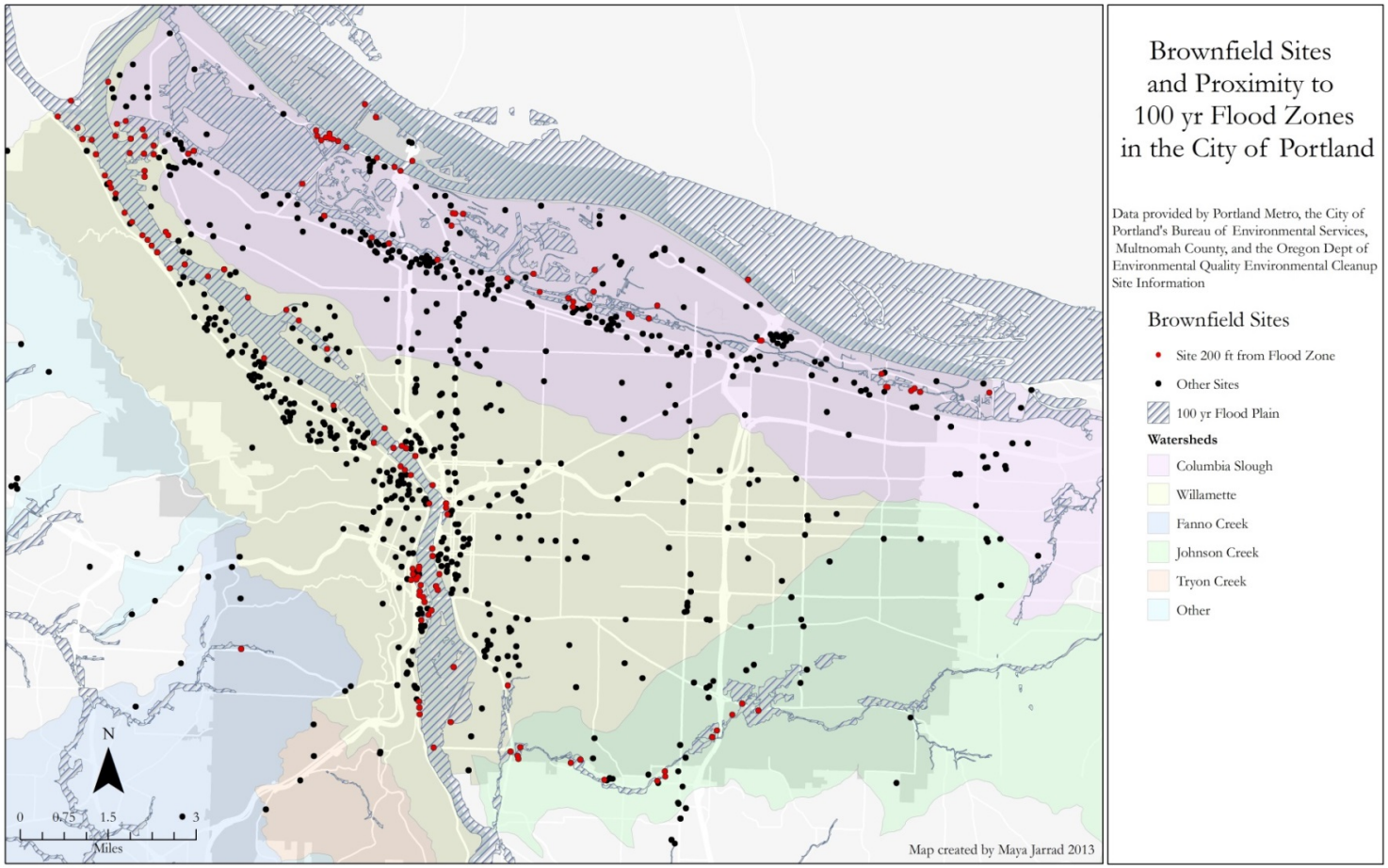
## 4.6 Brownfields and the Environment



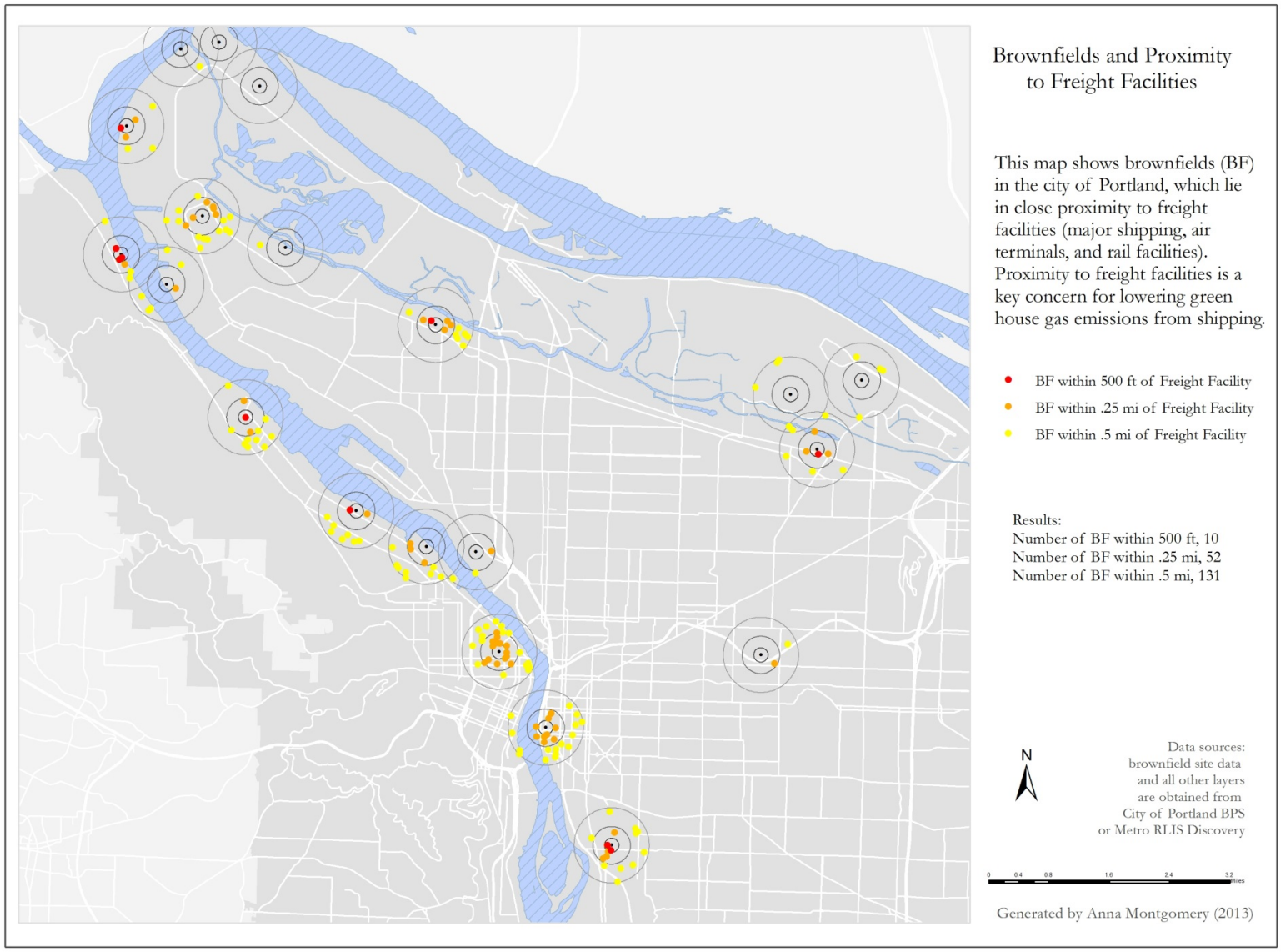

This map shows the 94 brownfield sites that are within conceptual greenways as part of the proposed City Greenways system. These greenways can be trails, parkways, green streets in urban neighborhoods, etc. Brownfield remediation can be a part of the construction of the City Greenways system, which would most definitely garner support from community members. There is a cluster of sites in downtown and the Pearl District, as well as a stream of sites on the greenway along 99E from south of the central eastside all the way to East Columbia. The city could team up with associations such as the Central Eastside Industrial Council and the Columbia Corridor Association to redevelop brownfields and build these greenways simultaneously.

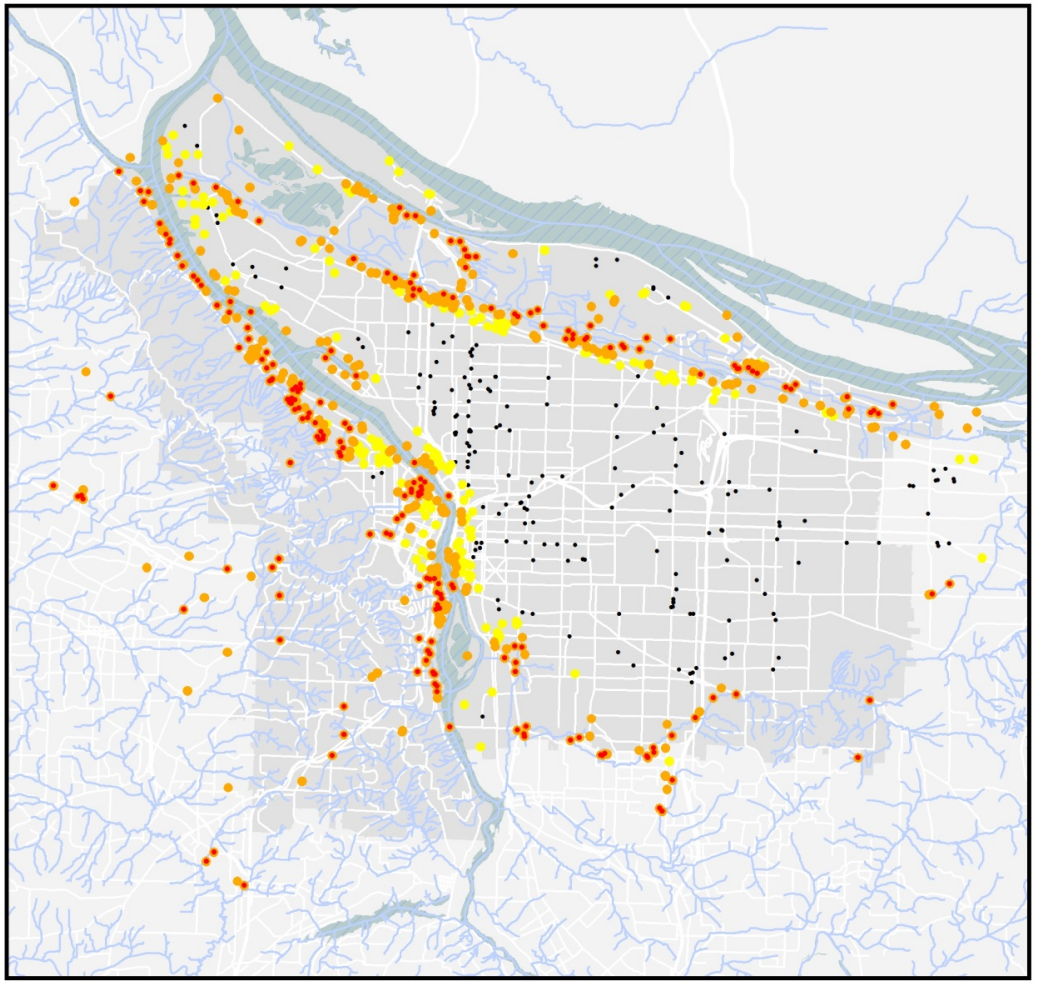



This map shows the 148 brownfield sites located within both existing and potential urban habitat corridors. These sites constitute about 18% of all brownfield sites. These habitats include "rivers and streams, drainageways, riparian areas, wetlands, large natural areas and upland habitats" (Portland Bureau of Planning and Sustainability 2013). Compared to the cluster nature in the greenways map, the brownfield sites here are scattered around the city, mostly along the river, within the Columbia Corridor, and Johnson Creek.




Brownfield Sites and Proximity to 100 yr Flood Zones in the City of Portland
Approximately 150 of over 800 sites are located in 100 year flood zone hazard areas, primarily in the Willamette and Columbia Slough watersheds. These watersheds are the majority of land in the city, containing 431 and 298 brownfield sites, respectively. The potential for contamination to spread from these sites, either due to "bleeding" of toxics into the water table, or due to flooding, is significant. Since a large cost of cleaning contamination is the removal of soils from the site, restricting toxics to the sites they are currently located will prevent increased future costs and confusion about responsible


Brownfields and Proximity to Freight Facilities
This map shows brownfields (BF) in the city of Portland, which lie in close proximity to freight facilities (major shipping, air terminals, and rail facilities). Proximity to freight facilities is a key concern for lowering green house gas emissions from shipping.
BF within 500 ft of Freight Facility
BF within .25 mi of Freight Facility
BF within .5 mi of Freight Facility
Results:
Number of BF within 500 ft, 10
Number of BF within .25 mi, 52
Number of BF within .5 mi, 131
N
Data sources: brownfield site data and all other layers are obtained from City of Portland BPS or Metro RLIS Discovery
0 0.4 0.8 1.6 2.4 3.2 Miles
Generated by Anna Montgomery (2013)



## Brownfield Sites and Proximity to Stream Routes

This map shows brownfields (BF) in the city of Portland, which lie in close proximity to stream routes. Proximity to stream routes is a key concern for maintaining the health of riparian zones. The toxins on sites near water may be more mobile and harder to contain.

Reuslts:
Number of BF within 500 ft, 291
Number of BF within .25 mi, 931
Number of BF within .5 mi, 2329

- BF Sites within 500 feet of stream
- BF Sites within .25 mi of stream
- BF Sites within .5 mi of stream
- All other BF

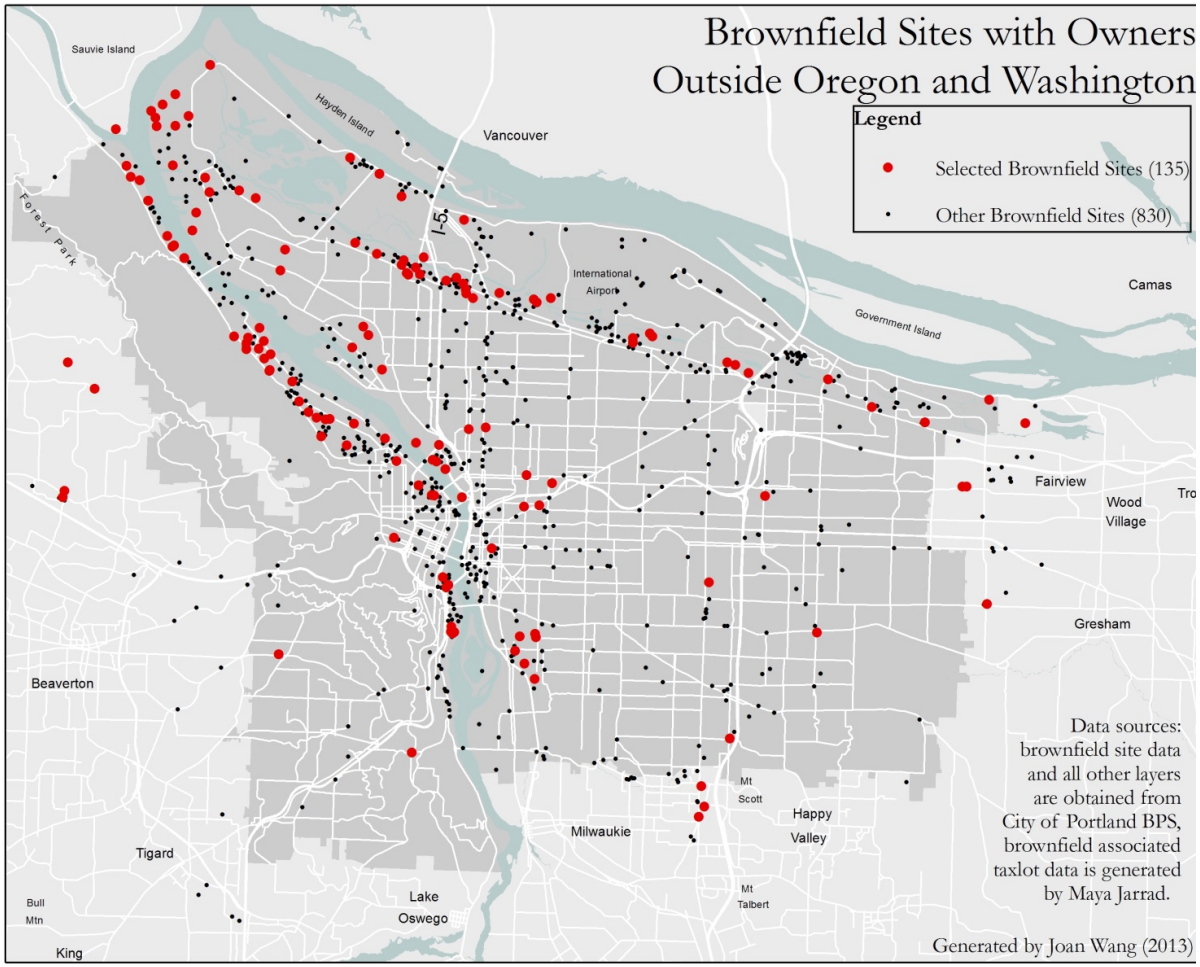
N

Data sources: brownfield site data and all other layers are obtained from City of Portland BPS or Metro RLIS Discovery

0 0.75 1.5 3 4.5 6 Miles

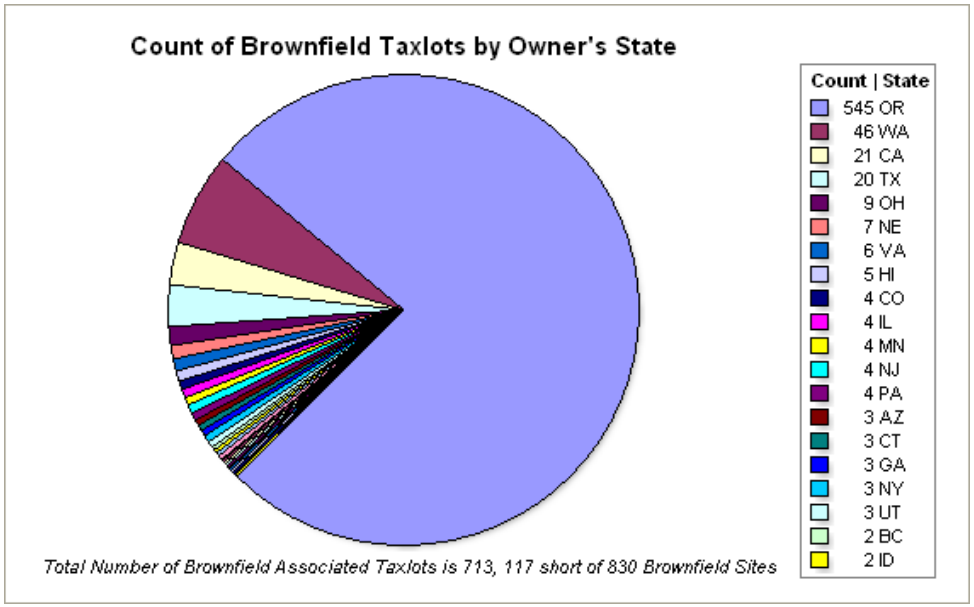
Generated by Anna Montgomery (2013)

## 4.7 Other Brownfield Information




There are instances where owners of brownfield properties are not local, thus there exists a lack of connection to the community that helps open up the remediation and redevelopment dialogue. The Portland Development Commission (PDC) works to point out financial incentives of redevelopment to property owners who might not care about these properties other than the appreciation of land value. It is important to determine whether these distant owners hold a higher stake in neighborhood brownfield redevelopment. If so, non-profits like Groundwork and organizations like the PDC could work with both local community members and distant property owners to start the redevelopment dialogue.
See below for a pie chart that breaks down the number of brownfield sites by the state in which the owner resides.

Several steps are involved to derive brownfield sites with distant owners (shown in red). First, using the brownfield associated tax lots layer, brownfield associated tax lots were selected by attribute if the state in which the owner resides is not Oregon or Washington. 122 out of 713 tax lots were selected. Then, actual brownfield sites were highlighted (shown in red above) if they are within the selected tax lots. There are 135 such sites, which constitute about 16% of all sites.


Count of Brownfield Taxlots by Owner's State
Count | State
545 OR
46 WA
21 CA
20 TX
9 OH
7 NE
6 VA
5 HI
4 CO
4 IL
4 MN
4 NJ
4 PA
3 AZ
3 CT
3 GA
3 NY
3 UT
2 BC
2 ID
Total Number of Brownfield Associated Taxlots is 713, 117 short of 830 Brownfield Sites