Assignment 3 : Conducting a Gap Analysis

"A Gap Analysis consists of mapping three data layers — land cover, predicted distributions of vertebrate species, and a stewardship layer. This data is then assessed to determine how much of a target species' (plant or animal) habitat is in conserved areas. From this assessment, planning decisions can be made about whether further protection is merited." As the statement said, the question of this research are how much species, Arizona Woodpecker, would be conserved in the protected areas and what kinds of land covers are Arizona Woodpecker's habitats by overlapping two data.

The mapping process started with acquiring and preparing the data. In this analysis, species data and modeling were firstly chosen to assess possible area that existed in online databases and local hard disks. Land cover, the second needed data, was downloaded then followed by Protected Areas data. Two Protected Areas data of two states were used. Moreover, Hydrologic Unit Codes data (HUCs) with 12 digits, Drainage data, Transportations data, Topoquads data and State Boundaries data were downloaded and used as additional data. Afterward, all data were imported to ArcMap to minimize unwanted data, to reduce size of data. Additionally, the selected areas were chosen by using state boundaries in the first step and then using topoquads to create a clip boundary. Some attributes of the data were queried and/or selected for specifying areas by joining with other tables in order to scope a possible data. HUCs and Species Range were combined by joining 12 digits' field; Protected Areas' table was queried and acquired merely Status 4 (There are no known public or private institutional mandates or legally recognized easements or deed restrictions held by the managing entity to prevent conversion of natural habitat types to anthropogenic habitat types).

After obtaining prepared data, dissolve Species Range using Dissolve Tool to combine into a single shape since needing an edge of species range including species distributions. Due to two Protected Areas (Arizona and New Mexico) are needed, Merge Tool merged them to a single layer. To answer how many species, Arizona Woodpecker, would be conserved in the protected areas, the tool namely Extraction by mask was selected. This tool could extract species that are looked alike a surface of protected areas and cut off un-relevant data on target areas, whereas other tools could not.

The consequences of this analysis are Species Distribution, which is in a Protected Areas found apart in Protected Areas sporadically. The massive area is the biggest protected area. Mostly, Arizona Woodpecker can be found nearby forest or woodland areas. Some of them can be found nearby temperate flooded and swamp

forest areas. However, the species is rarely found along the highways and railroads or even in the urban areas located in or nearby the protected areas. Arizona Woodpecker can be found in New Mexico State, as well. From the graphics assessment, it was found that likely less than 30% of all Species Distribution has been conserved.
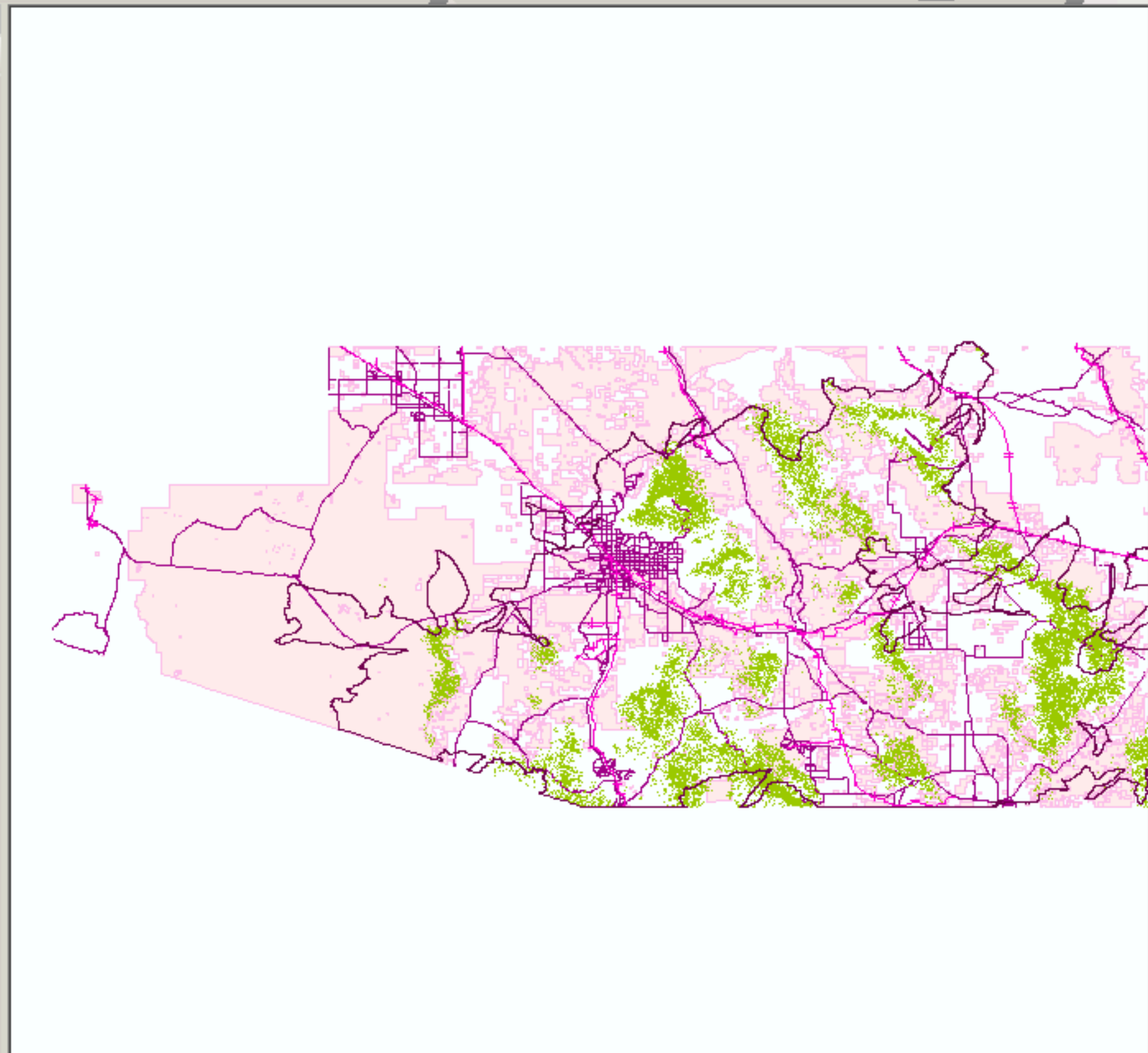
To sum up, this analysis revealed that Arizona Woodpecker has not been conserved as well as it has to be. It might be due to the fact that most of them have their habitats out of the protected areas. In my point of view, expansion of more conserved areas and limiting the expansion of urban areas would yield high percentage of the conserved species.

Assignment_3 - ArcMap - ArcInfo

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Layers
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- ☑ highway_Clip
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- ☑ status_4_clip
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- ☑ quads_projected
- ☐ topoq100
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- ☑ highway_AZ_clip
- ☑ PADUS1_3AZ_status_4
- ☑ PADUS1_3NM_status_4
- ☑ Arizona_Boudary
- ☑ WBD_HU12
- ☐ hydroln
- ☐ Drainage Systems
- ☐ dtl_riv
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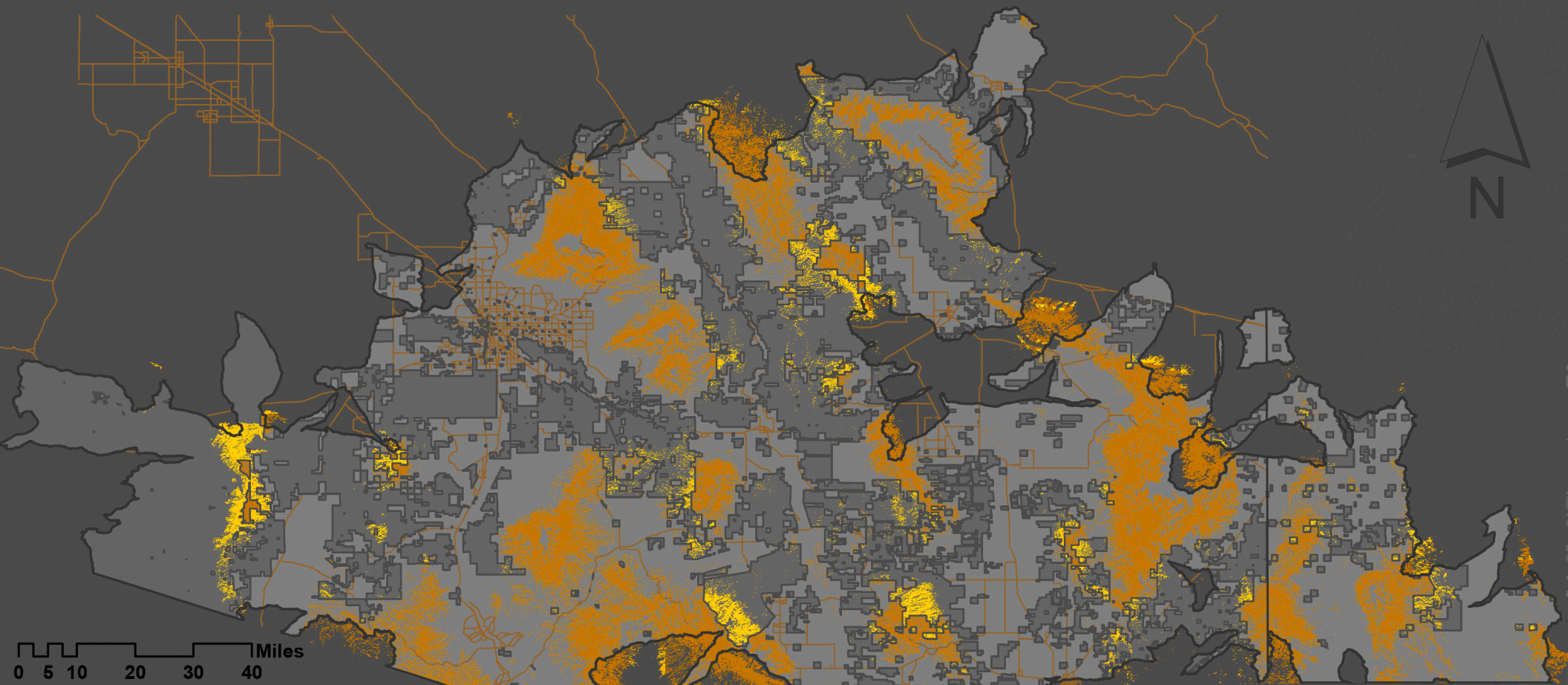- ☐ hydroln
- ☐ US States
- ☐ PADUS1_3MPA
- ☐ PADUS1_3AZ
- ☐ LandCover_az
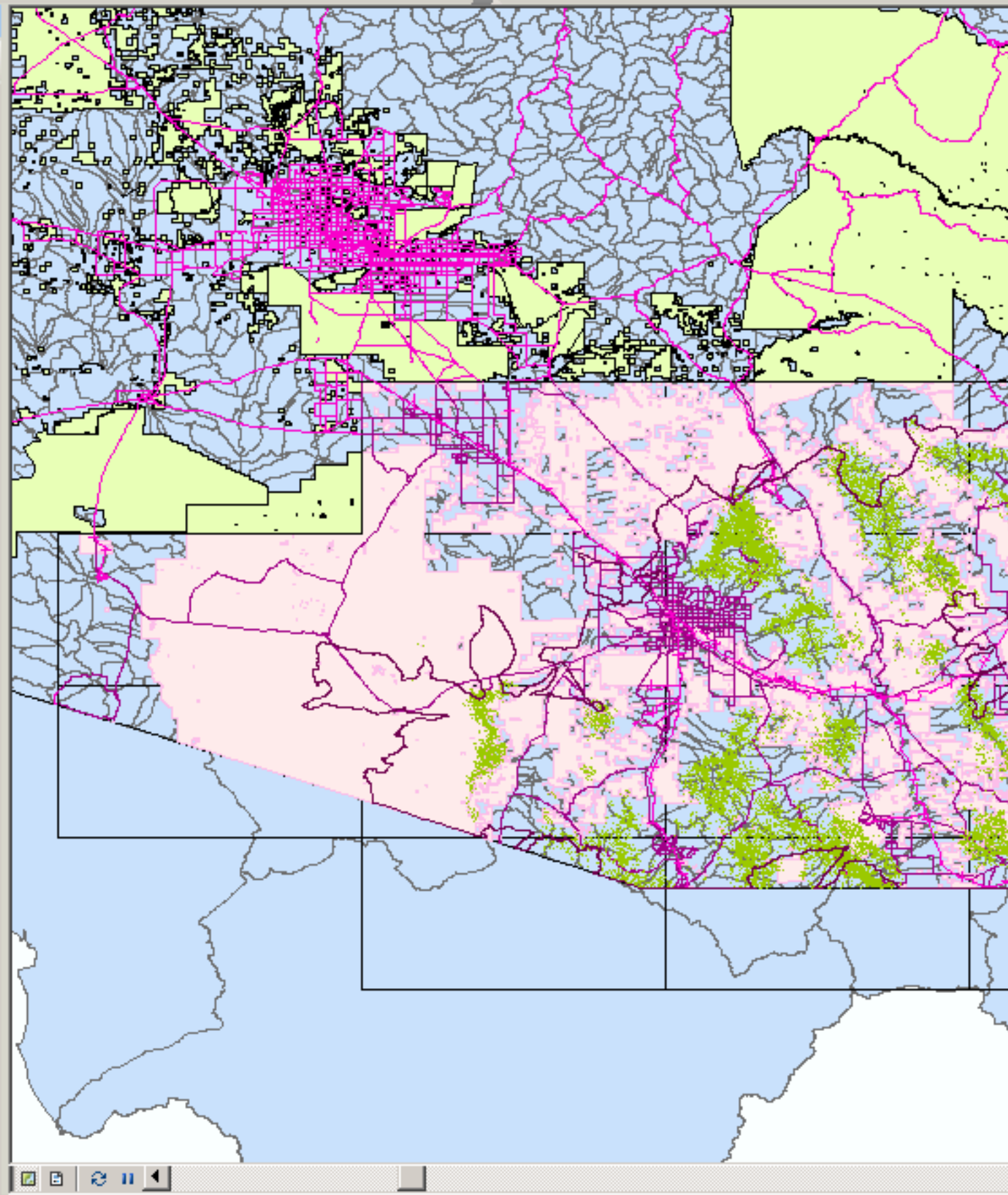
Table

WBD_HU12

AreaSqKm	States	HUC12	Name
29.691812	ND	101101010603	Willow Creek
70.840284	NE	102500040304	Outlet Muddy Creek
71.649656	NE	102500040305	West Union Cemetery-Republican River
45.336973	NE	102500040306	Camp Creek
41.108004	NE	102500040307	102500040307
31.346978	NE	102500040308	102500040308
95.089069	ND	101101010604	Cedar Butte
122.344672	ND	101101010605	Cedar Creek
43.212371	ND	101101010701	Wild Cow Creek
93.862871	ND	101101010702	Halfbreed Creek
53.082663	ND	101101010703	Long Creek
33.281377	ND	101101010704	Gamache Creek
114.157874	ND	101101010705	Cedar Coulee
44.300976	ND	101101010706	Hungry Gulch
45.207473	ND	101101010707	Stone Johnny Coulee
132.255432	ND	101101010801	Headwaters Tobacco Garden Creek
31.342931	ND	101101010802	101101010802
41.573393	ND	101101010803	Timber Prong Creek
128.508039	ND	101101010804	Upper Tobacco Garden Creek
35.72568	ND	101101010805	Demicks Lake
151.247346	ND	101101010806	Upper Clear Creek
73.005354	ND	101101010807	Lower Clear Creek
88.929749	ND	101101010808	Middle Tobacco Garden Creek
66.263286	ND	101101010809	Lower Tobacco Garden Creek
82.442632	ND	101101010901	Nelson Creek
140.555542	ND	101101010902	Upper Beaver Creek
112.223475	ND	101101010903	Middle Beaver Creek
67.064564	ND	101101010904	Upper Dry Fork Creek
65.287992	ND	101101010905	Lower Dry Fork Creek
53.920363	ND	101101010906	Lower Beaver Creek
73.543587	ND	101101011001	Upper Sand Creek
105.400469	ND	101101011002	Lower Sand Creek
47.145919	ND	101101011003	Red Mike Hill
226.073787	NE	102500040309	Swanson Lake-Republican River
115.230292	NE	102500040401	Attica Cemetery
98.306323	NE	102500040402	102500040402
141.43371	NE	102500040403	Headwaters Blackwood Creek
69.023244	NE	102500040404	102500040404
123.947228	NE	102500040405	Upper Blackwook Creek
99.002383	NE	102500040406	Headwaters Little Blackwood Creek

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Arizona Woodpecker

(Picoides arizonae)

Distribution and Gap status
Arizona and New Mexico

Miles
0 5 10 20 30 40

ARIZONA   NEW MEXICO

Gap
Species Distribution
Protected Areas
General Areas
Species Range
Highway Roads