Illinois Animal Shelter dataset 2010-2014

Jim Cloud and Dick Xu

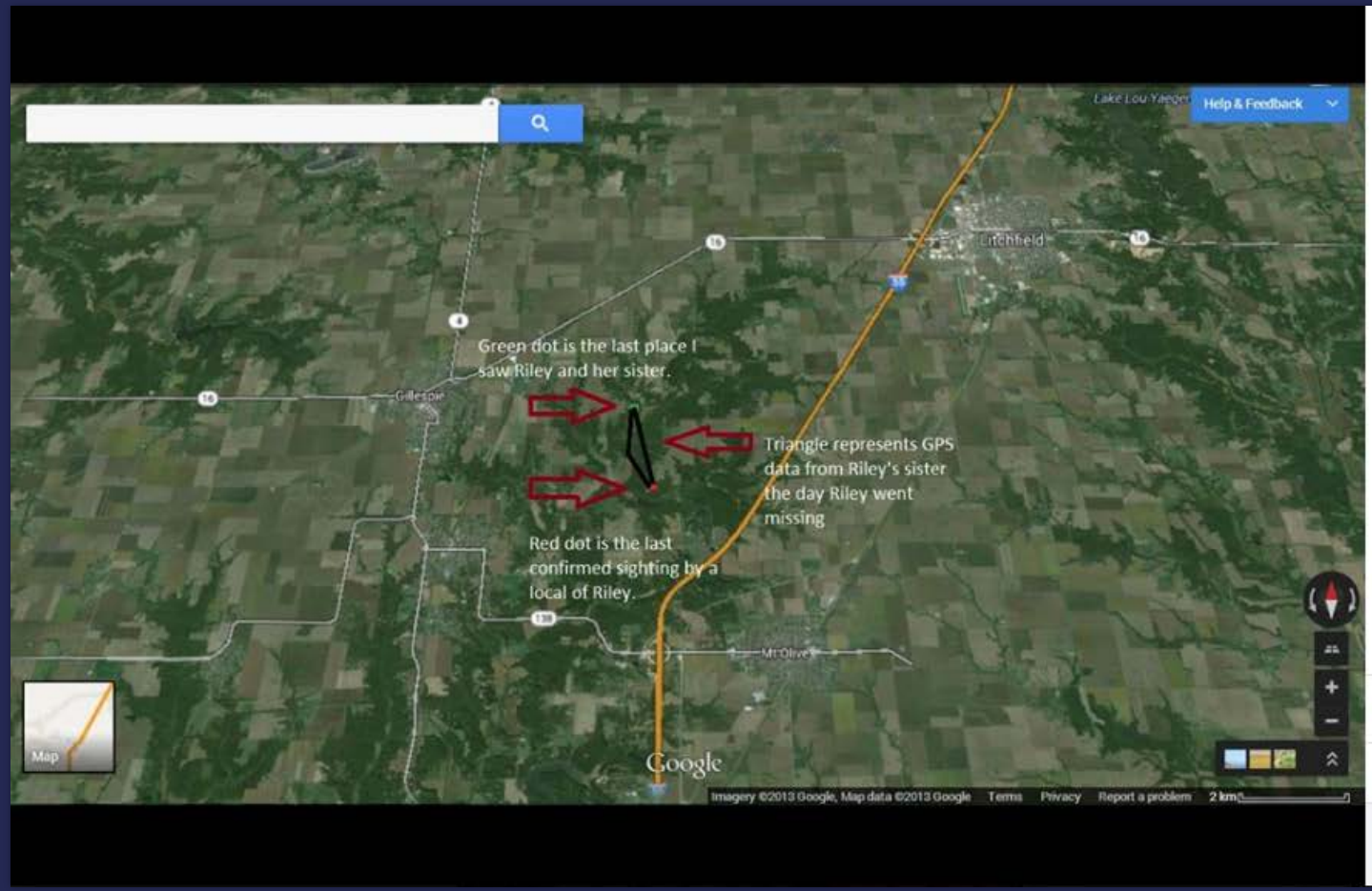
Why did I become so interested in Animal Shelter Statistics?

On November 2nd, 2012, while visiting the family farm in Macoupin County, IL my two dogs, Yoshimi and Riley, ran off chasing deer. Only one Yoshimi returned.

In the ensuing weeks I became active in local animal shelters and rescue organizations while trying to locate Riley.

I also started my first Facebook Group

https://www.facebook.com/OperationFindRiley/



Operation Find Riley
Like This Page · November 1, 2013 ·

Exactly 1 year ago, the last confirmed sighting of Riley occurred that I know of.

A resident near the new Mt. Olive Lake Reservoir saw Riley and Yoshimi chasing deer and making a ruckus just north of the lake. That matches the time and place Yoshimi's GPS coordinates put her at. According to the witness, he stated that they were heading towards Lake KaHo. My GPS records for Yoshimi state tha... See More

20 5 Comments 26 Shares

Like Comment Share

Most Relevant

Deborah Rolando If you have any farms or

Write a comment...

What were the outcomes to consider during the search?

- Sighted and not contained.
  - Need more reports of sightings to confirm where live traps can be set and to alert those in the area to be on the lookout.
- Sighted and contained
  - Contact me directly if collar is still attached.
  - Routed through the typical ‘leash law’ violation protocol via local law enforcement and the AC Department to get to the County Shelter.
  - The finder keeps Riley for themselves.
  - The finder rehomes or sells the dog to family, friends, Facebook, Craigslist, etc.
  - The finder takes Riley to a rescue group or shelter outside of the Macoupin, Montgomery, Madison system.
- Deceased
  - Clowns with guns
  - Vehicular
  - Dog Fighting
  - Freak accident

So I asked if I could get the shelter stats…

RE: 3 German Shepherds seen wandering

1 message

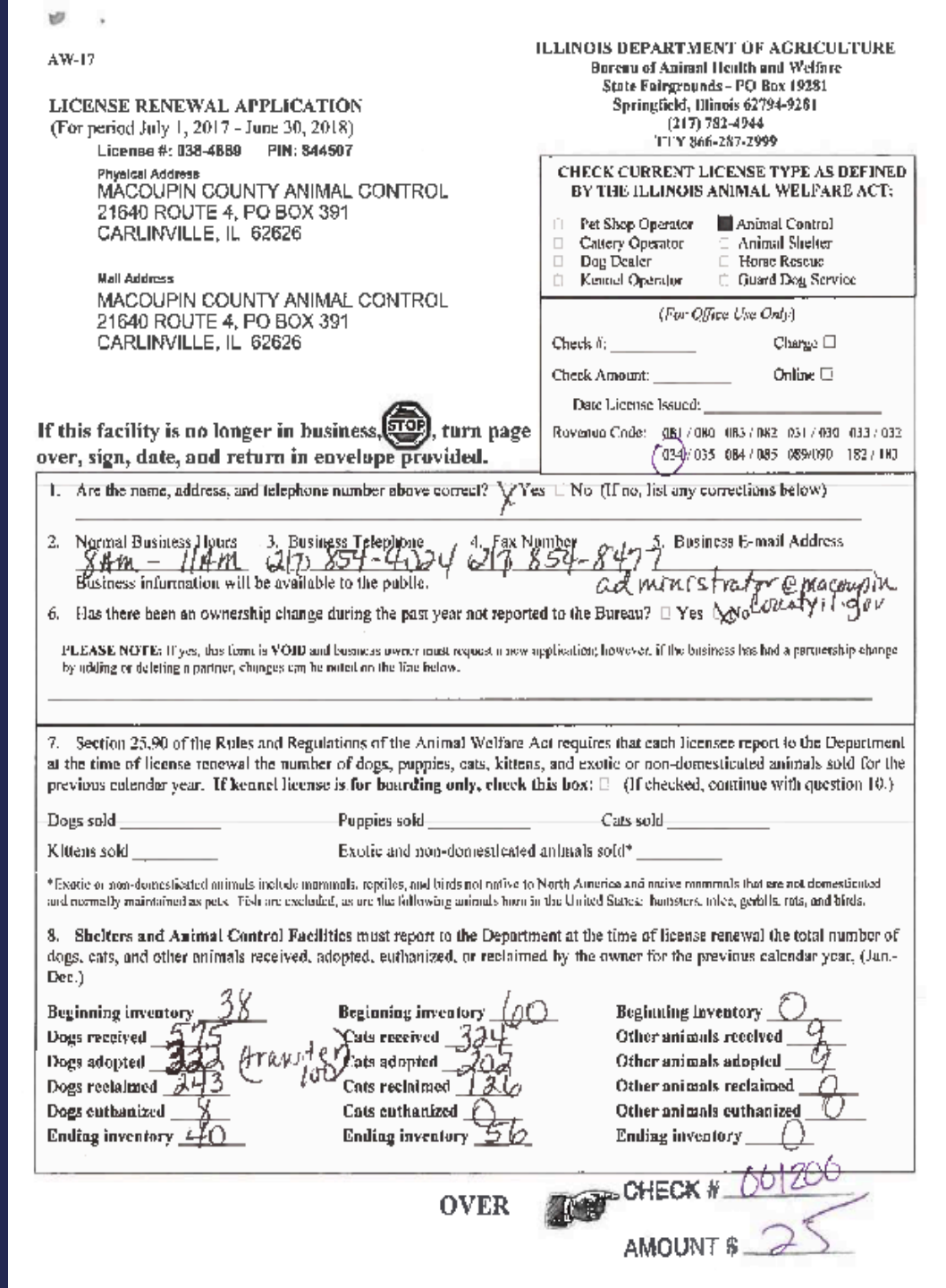
Macoupin County Animal Control <administrator@macoupincountyil.gov> Mon, Jan 14, 2013 at 6:56 AM
To: James Cloud <[redacted]@gmail.com>

There are no numbers Jim as we are not on a computer program to keep this kind of information. The county clerk has no records for me either. Come in sometime and we can talk about this

So I did what I thought any responsible citizen would do and filed a FOIA request

- Jim created an Excel spreadsheet with over 2,000 entries
- Shelter Data composed of the animals received, adopted, euthanized, and reclaimed (RTO) broken into Dogs, Cats, and Other.

An example of Illinois Department of Agriculture Shelter License Renewal Form



AW-17

ILLINOIS DEPARTMENT OF AGRICULTURE
Bureau of Animal Health and Welfare
State Fairgrounds – PO Box 19281
Springfield, Illinois 62794-9281
(217) 782-4944
TTY 866-287-2999

LICENSE RENEWAL APPLICATION
(For period July 1, 2017 - June 30, 2018)
License #: 038-4889 PIN: 844507

Physical Address
MACOUPIN COUNTY ANIMAL CONTROL
21640 ROUTE 4, PO BOX 391
CARLINVILLE, IL 62626

Mail Address
MACOUPIN COUNTY ANIMAL CONTROL
21640 ROUTE 4, PO BOX 391
CARLINVILLE, IL 62626

CHECK CURRENT LICENSE TYPE AS DEFINED BY THE ILLINOIS ANIMAL WELFARE ACT:

- ☐ Pet Shop Operator
- ☐ Cattery Operator
- ☐ Dog Dealer
- ☐ Kennel Operator
- ■ Animal Control
- ☐ Animal Shelter
- ☐ Horse Rescue
- ☐ Guard Dog Service

(For Office Use Only)
Check #: _____ Charge ☐
Check Amount: _____ Online ☐
Date License Issued: _____
Revenue Code: 081 / 080 083 / 082 031 / 030 033 / 032 034 / 035 084 / 085 089/090 182 / 180

If this facility is no longer in business, STOP, turn page over, sign, date, and return in envelope provided.

1. Are the name, address, and telephone number above correct? X Yes ☐ No (If no, list any corrections below)

2. Normal Business Hours: 8am - 11am
3. Business Telephone: 217 854-4424
4. Fax Number: 217 854-8477
5. Business E-mail Address: administrator@macoupincountyil.gov

Business information will be available to the public.

6. Has there been an ownership change during the past year not reported to the Bureau? ☐ Yes ☒ No

PLEASE NOTE: If yes, this form is VOID and business owner must request a new application; however, if the business has had a partnership change by adding or deleting a partner, changes can be noted on the line below.

7. Section 25.90 of the Rules and Regulations of the Animal Welfare Act requires that each licensee report to the Department at the time of license renewal the number of dogs, puppies, cats, kittens, and exotic or non-domesticated animals sold for the previous calendar year. If kennel license is for boarding only, check this box: ☐ (If checked, continue with question 10.)

Dogs sold _____ Puppies sold _____ Cats sold _____
Kittens sold _____ Exotic and non-domesticated animals sold* _____

*Exotic or non-domesticated animals include mammals, reptiles, and birds not native to North America and native mammals that are not domesticated and normally maintained as pets. Fish are excluded, as are the following animals born in the United States: hamsters, mice, gerbils, rats, and birds.

8. Shelters and Animal Control Facilities must report to the Department at the time of license renewal the total number of dogs, cats, and other animals received, adopted, euthanized, or reclaimed by the owner for the previous calendar year, (Jan.-Dec.)

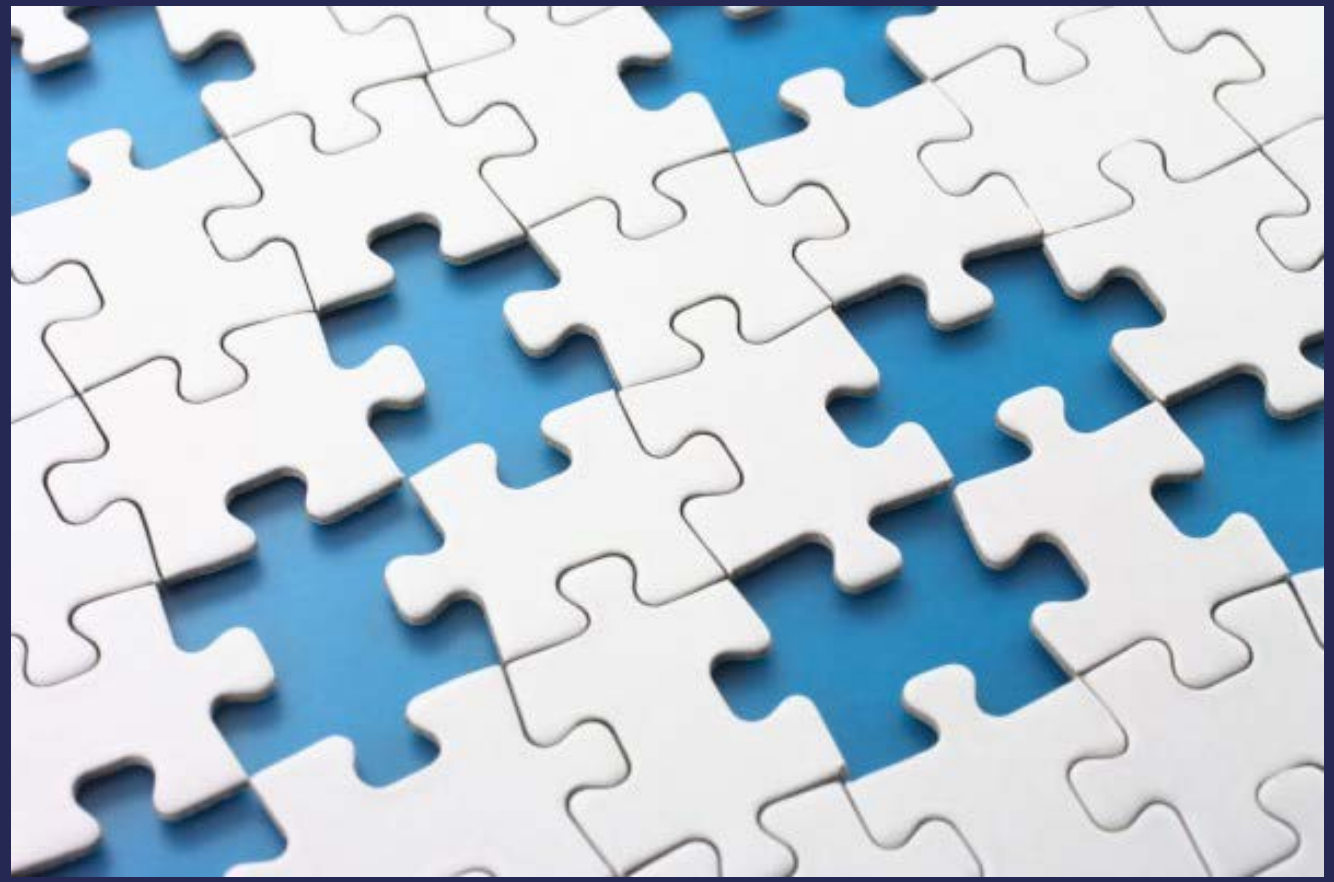
Beginning inventory 38	Beginning inventory 100	Beginning inventory 0
Dogs received 575	Cats received 324	Other animals received 9
Dogs adopted 322	Cats adopted 209	Other animals adopted 9
Dogs reclaimed 243	Cats reclaimed 126	Other animals reclaimed 0
Dogs euthanized 8	Cats euthanized 0	Other animals euthanized 0
Ending inventory 40	Ending inventory 56	Ending inventory 0

transfer 100

OVER

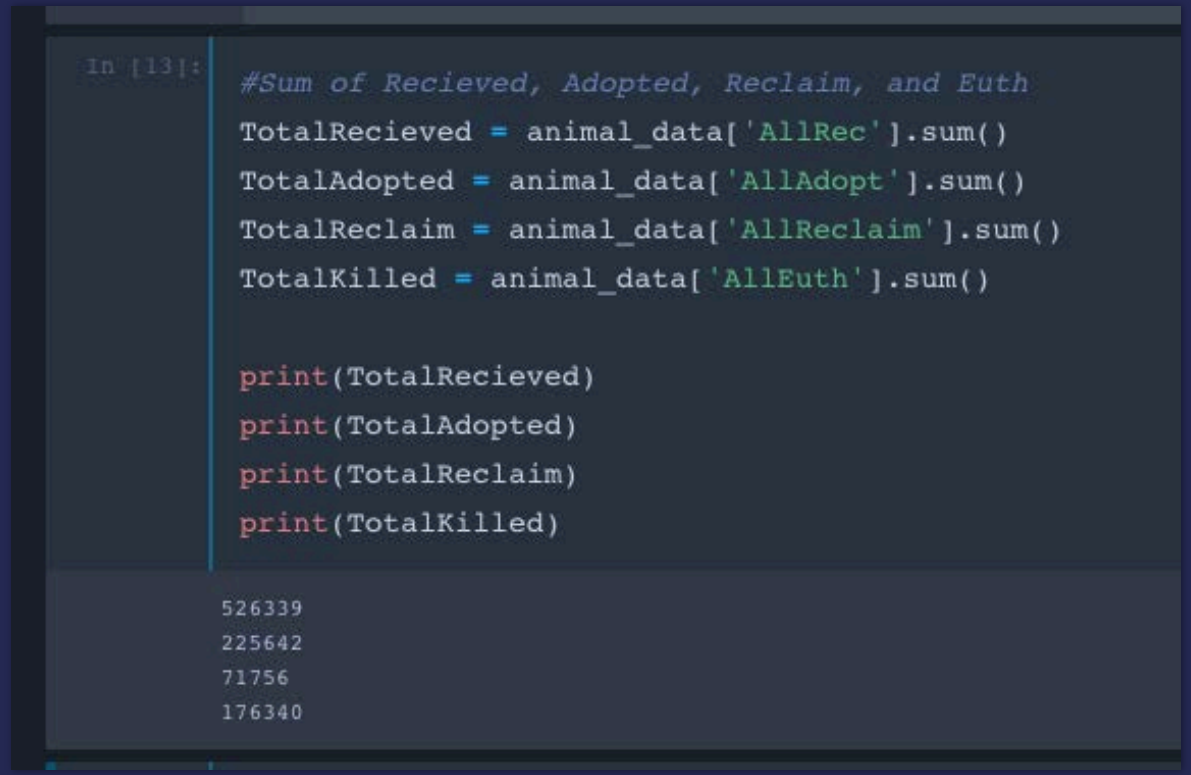
CHECK # 661206
AMOUNT $ 25

Early Obstacles



- Difficulty importing from Excel and utilizing CSV
  - Blank spaces and 'invisible characters' prevent Pandas from importing the data.
- Self-submitted information
  - No Standardization
  - Working on the 'Honor System'
- Not all shelters are accounted for all 5 years.
  - Dataset shrank from 2400 records to 1150 records.
  - Sample size of data set from complete data set: ~1/3 (1150/3000)
  - No Cook County Data

Step 1: Top-Down View



```
In [13]:
#Sum of Recieved, Adopted, Reclaim, and Euth
TotalRecieved = animal_data['AllRec'].sum()
TotalAdopted = animal_data['AllAdopt'].sum()
TotalReclaim = animal_data['AllReclaim'].sum()
TotalKilled = animal_data['AllEuth'].sum()

print(TotalRecieved)
print(TotalAdopted)
print(TotalReclaim)
print(TotalKilled)

526339
225642
71756
176340
```

Total Animals Received = 526,339 Animals

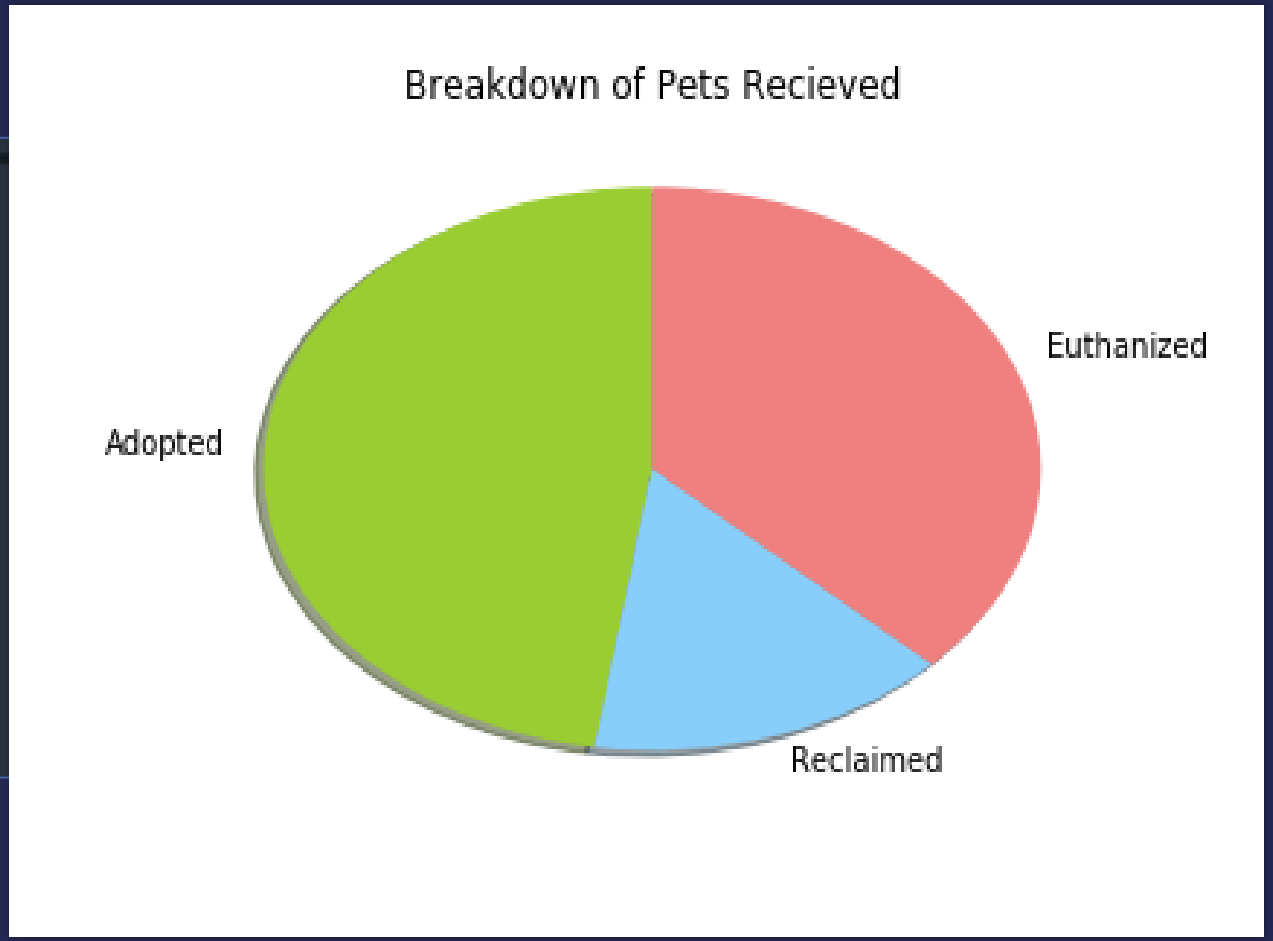
Total Adopted = 225, 642 Animals

Total Reclaimed = 71,756 Animals

Total Euthanized = 176,340 Animals

Step 2: Pie Chart

```
In [4]:
#Make pie graph
categories = ('Adopted',
              'Reclaimed',
              'Euthanized')
totals = [ TotalAdopted, TotalReclaim, TotalKilled]
colors = ['yellowgreen','lightskyblue','lightcoral']

fig1, ax1 = plt.subplots()
ax1.pie(totals, colors=colors, shadow = True, startangle= 90, labels=categories)
plt.title('Breakdown of Pets Recieved')

plt.savefig('piechart.png')
plt.show
```



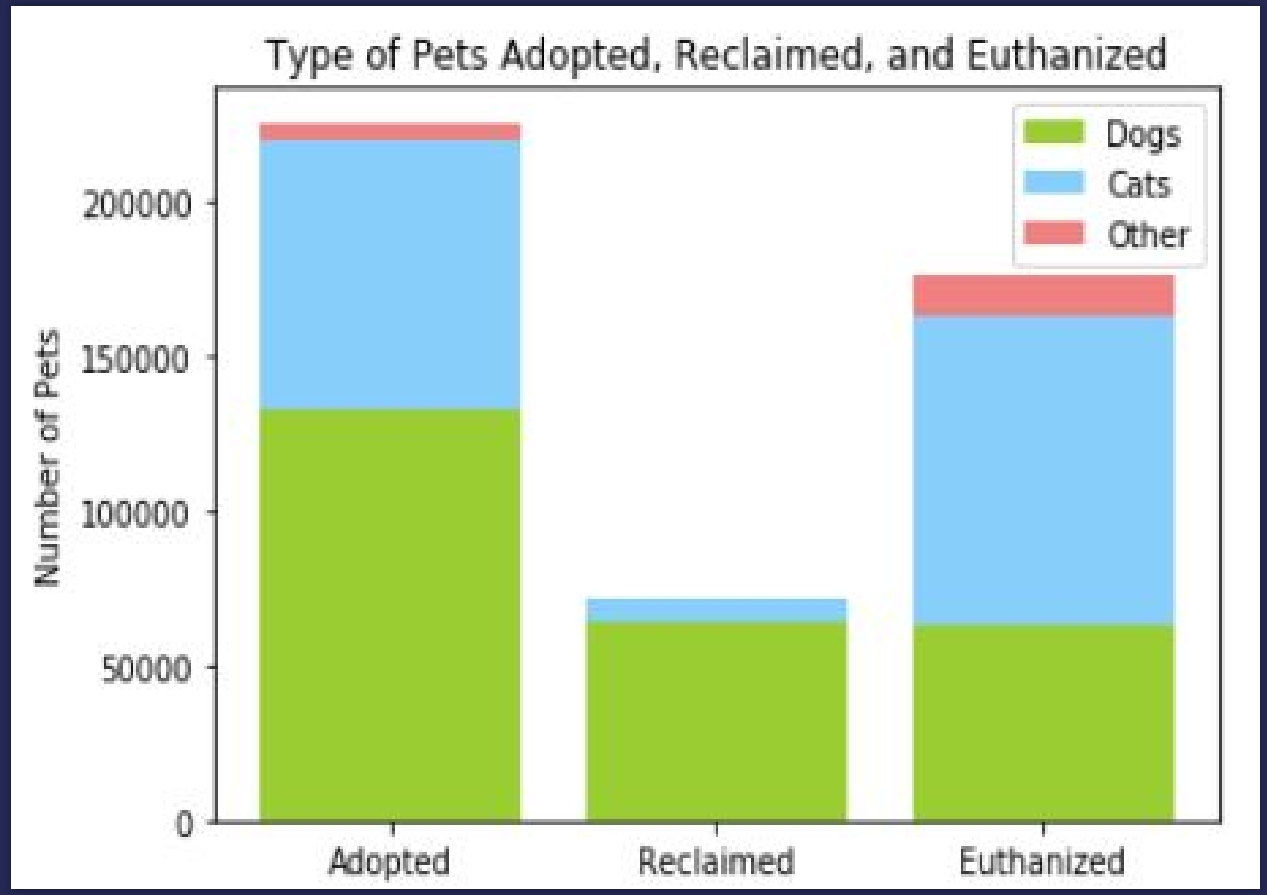
Step 3: Breakdown by Species

```
In [4]:
#Breakdown by Type
DogsAdopt = animal_data['DogAdopt'].sum()
DogsReclaim = animal_data['DogReclaim'].sum()
DogsEuth = animal_data['DogEuth'].sum()

# print(DogsAdopt)
# print(DogsReclaim)
# print(DogsEuth)

CatsAdopt = animal_data['CatsAdopt'].sum()
CatsReclaim = animal_data['CatsReclaim'].sum()
CatsEuth = animal_data['CatEuth'].sum()

# print(CatsAdopt)
# print(CatsReclaim)
# print(CatsEuth)

OtherAdopt = animal_data['OtherAdopt'].sum()
OtherReclaim = animal_data['OtherReclaim'].sum()
OtherEuth = animal_data['OtherEuth'].sum()

# print(OtherAdopt)
# print(OtherReclaim)
# print(OtherEuth)
```

	Adopted	Reclaimed	Euthanized
Dogs	132,242	64,481	62,852
Cats	87,496	6,835	100,565
Other	5,904	440	12,923

Step 4: Stacked Bar Graph

```
#Make stacked bar graph for adopted, reclaimed, and euth by ty
DogBar = [DogsAdopt, DogsReclaim, DogsEuth]
CatBar = [CatsAdopt, CatsReclaim, CatsEuth]
OtherBar = [OtherAdopt, OtherReclaim, OtherEuth]
x = np.arange(len(DogBar))

plt.bar(x, DogBar, color = 'yellowgreen', align='center', label='Dogs')
plt.bar(x, CatBar, color = 'lightskyblue', bottom=DogBar, label='Cats')
plt.bar(x, OtherBar, color = 'lightcoral', bottom = list(map(lambda x,y:
                            x+y, DogBar, CatBar)),label='Other')

categories = ['Adopted',
              'Reclaimed',
              'Euthanized']
plt.title('Type of Pets Adopted, Reclaimed, and Euthanized')
plt.ylabel('Number of Pets')
plt.xticks(x, categories)
plt.legend(loc="best")

#plt.legend(handles=[categories])
plt.savefig('stackedbarchart.png')
plt.show()
```



Step 5: Yearly Breakdown

In [7]:

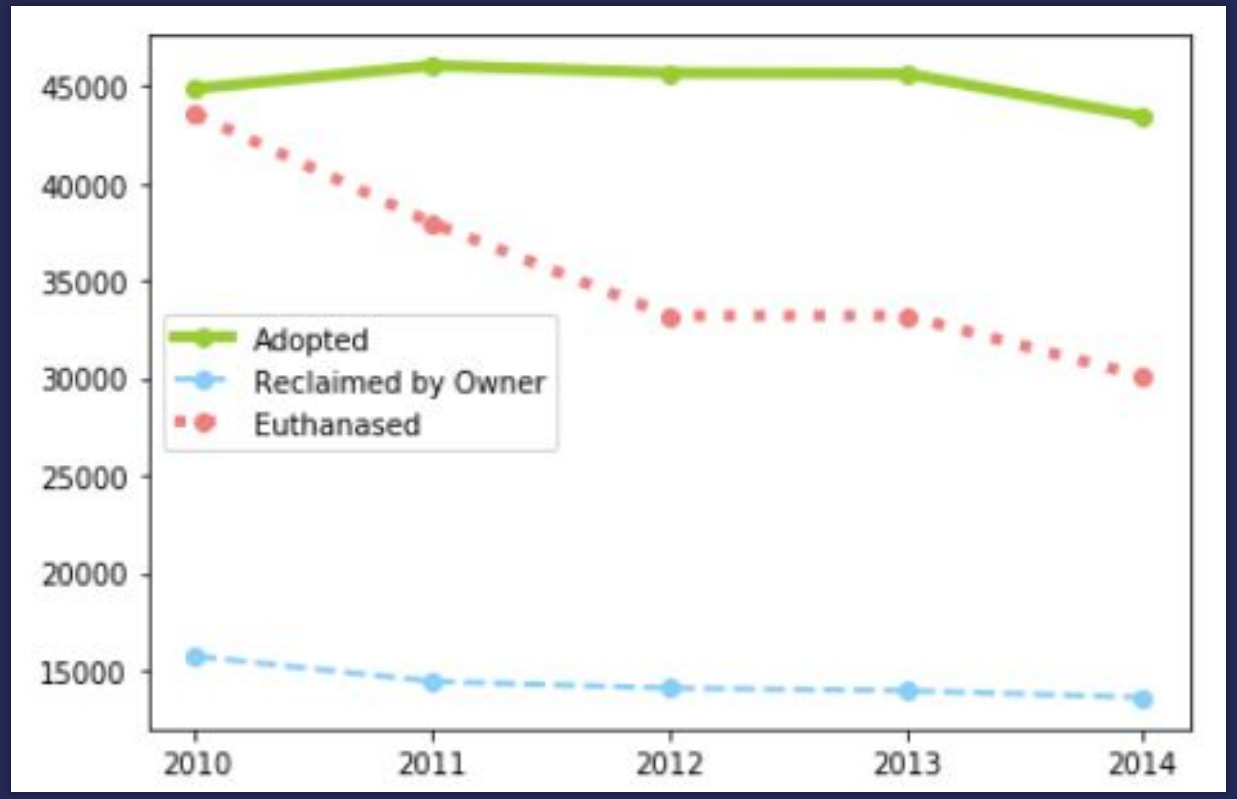
```
DogAdoptYears = animal_data.groupby('Year')['DogAdopt'].sum()
DogReclaimYears = animal_data.groupby('Year')['DogReclaim'].sum()
DogEuthYears = animal_data.groupby('Year')['DogReclaim'].sum()
DogRcYears = animal_data.groupby('Year')['DogRec'].sum()
#print(DogAdoptYears, DogReclaimYears, DogEuthYears)

CatAdoptYears = animal_data.groupby('Year')['CatsAdopt'].sum()
CatReclaimYears = animal_data.groupby('Year')['CatsReclaim'].sum()
CatEuthYears = animal_data.groupby('Year')['CatEuth'].sum()
CatRcYears = animal_data.groupby('Year')['CatRec'].sum()
#print(CatAdoptYears, CatReclaimYears, CatEuthYears)

OtherAdoptYears = animal_data.groupby('Year')['OtherAdopt'].sum()
OtherReclaimYears = animal_data.groupby('Year')['OtherReclaim'].sum()
OtherEuthYears = animal_data.groupby('Year')['OtherEuth'].sum()
OtherRcYears = animal_data.groupby('Year')['OtherRec'].sum()
# print(OtherAdoptYears, OtherReclaimYears, OtherEuthYears)
```

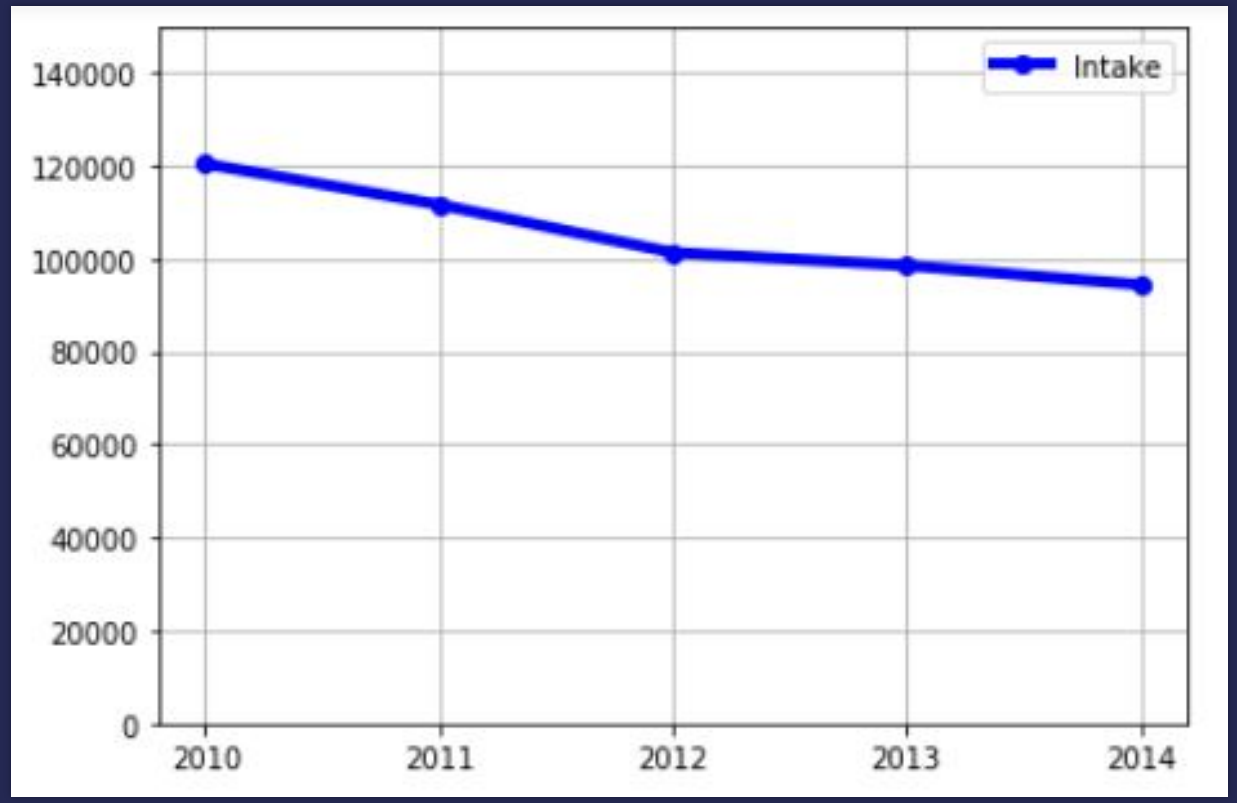
Step 6: Trendline Code

In [47]:

```
#Line Values
GraphEuth = SumEuthYears
GraphReclaim = SumReclaimYears
GraphAdopt = SumAdoptYears
GraphRec = SumRecYears

#x Values
x_pos = [2010,2011,2012,2013,2014]

#plotting on graph
plt.plot(GraphAdopt, color='yellowgreen', linewidth=4, label='Adopted')
plt.plot(GraphReclaim, color='lightskyblue', linewidth=2, linestyle = 'dashed', label='')
plt.plot(GraphEuth, color='lightcoral', linewidth=4, linestyle = 'dotted')
#plt.plot(GraphRec, color='lightcoral', linewidth=4, linestyle = 'dotted')

#graph lables
plt.title('Trends Between 2012-2014')
plt.xlabel(x_pos)
plt.ylabel('Number of Animals')
plt.show
```

Step 7: Trendline Charts





Step 8:

Census API

In [39]:

```
# Run Census Search to retrieve data on all zip codes (2013 ACS5 Census)
# See: https://github.com/CommerceDataService/census-wrapper for library documentation
# See: https://gist.github.com/afhaque/60558290d6efd892351c4b64e5c01e9b for labels
census_data = c.acs5.get(("NAME", "B19013_001E", "B01003_001E", "B01002_001E",
                          "B19301_001E",
                          "B17001_002E"), {'for': 'zip code tabulation area:*'})

# Convert to DataFrame
census_pd = pd.DataFrame(census_data)

# Column Reordering
census_pd = census_pd.rename(columns={"B01003_001E": "Population",
                                      "B01002_001E": "Median Age",
                                      "B19013_001E": "Household Income",
                                      "B19301_001E": "Per Capita Income",
                                      "B17001_002E": "Poverty Count",
                                      "NAME": "Name", "zip code tabulation area": "Zip"})

# Add in Poverty Rate (Poverty Count / Population)
census_pd["Poverty Rate"] = 100 * \
    census_pd["Poverty Count"].astype(
        int) / census_pd["Population"].astype(int)

# Final DataFrame
census_pd = census_pd[["Zip", "Population", "Median Age", "Household Income",
                       "Per Capita Income", "Poverty Count", "Poverty Rate"]]


# Visualize
print(len(census_pd))
census_pd.head()
```

Step 9: Merge

	Zip	Population	Median Age	Household Income	Per Capita Income	Poverty Count	Poverty Rate
0	00601	18450.0	36.6	12041.0	7380.0	10816.0	58.623306
1	00602	41302.0	38.6	15663.0	8463.0	22409.0	54.256452
2	00603	53683.0	38.9	15485.0	9176.0	26220.0	48.842278
3	00606	6591.0	37.3	15019.0	6383.0	3721.0	56.455773
4	00610	28963.0	39.2	16707.0	7892.0	14569.0	50.302110

In [40]:

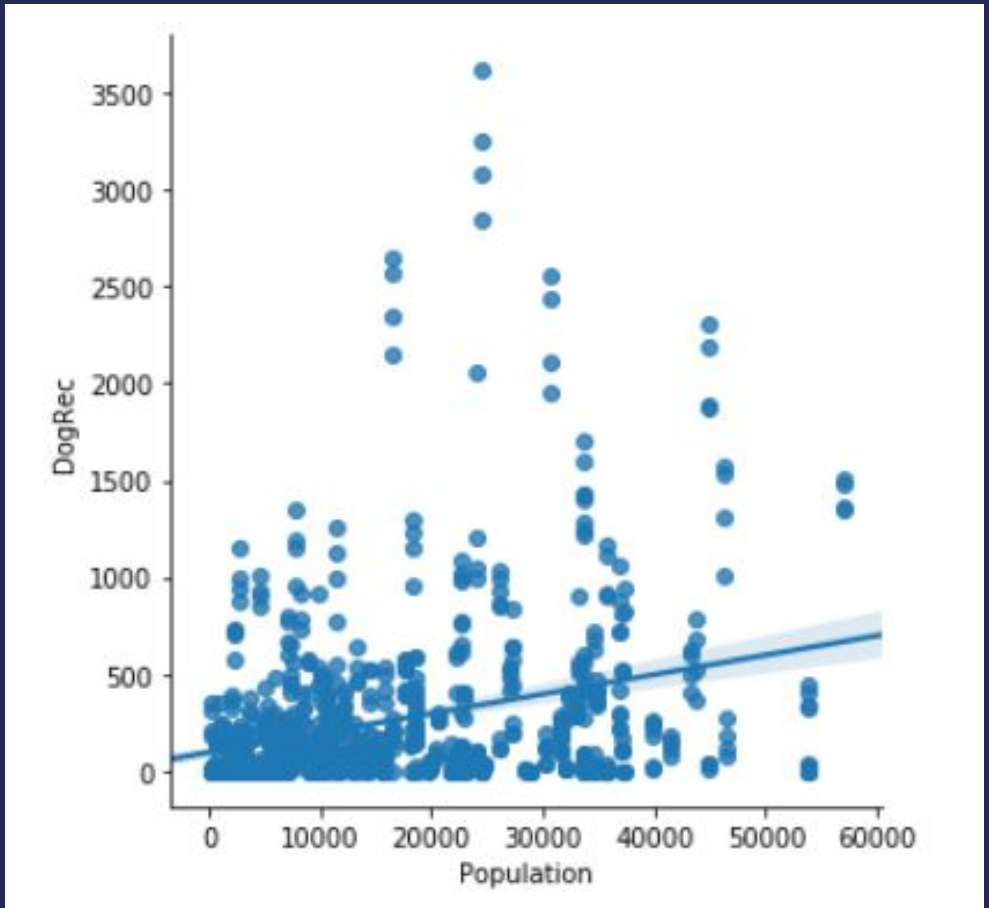
```
ShelterCensusMerge = pd.merge(animal_data, census_pd, on='Zip')
ShelterCensusMerge.dtypes
```

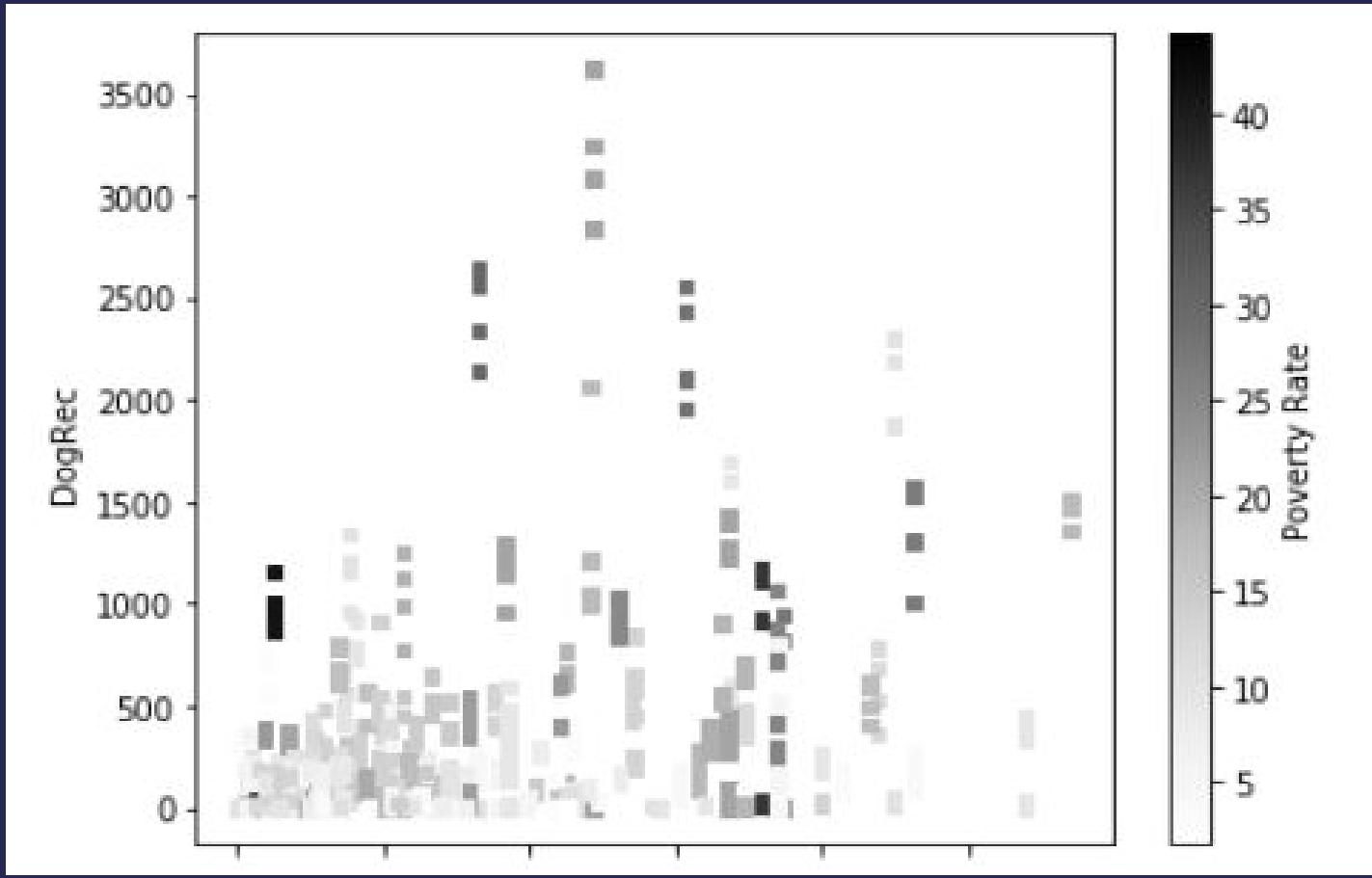
Step 10: Grey Scale and Regression

```
ShelterCensusMerge.plot.scatter(x='Population', y='DogRec', c='Poverty Rate', marker='s')
#sds.lmplot(x='Population',y='DogRec',data=ShelterCensusMerge,fit_reg=True)

#graph lables
plt.title = ("Dogs Recieved per Population and Poverty Rate")
plt.xlabel = ("Population")
plt.ylabel = ("Number Number of Dogs (intake) per shelter")

plt.show
```

```
sds.lmplot(x='Population',y='DogRec',data=ShelterCensusMerge,fit_reg=True)plt.show
```

Step 11: Regression and Grey Scale Chart





P-Values for Dog outcomes vs Population: Range (1.7 to 2.2) = low correlation Cats and Other are worse

```
Population = ShelterCensusMerge['Population']
stats.ttest_ind(Population,ShelterCensusMerge.DogAdopt.astype(np.float), equal_var=False)
```

```
Ttest_indResult(statistic=35.25629774385381, pvalue=1.7611535261723664e-173)
```

```
Population = ShelterCensusMerge['Population']
stats.ttest_ind(Population,ShelterCensusMerge.DogRec.astype(np.float), equal_var=False)
```

```
Ttest_indResult(statistic=34.93229273507115, pvalue=1.8954633774062492e-171)
```

```
Population = ShelterCensusMerge['Population']
stats.ttest_ind(Population,ShelterCensusMerge.DogReclaim.astype(np.float), equal_var=False)
```

```
Ttest_indResult(statistic=35.40010277302028, pvalue=2.083879981094513e-174)
```

```
Population = ShelterCensusMerge['Population']
stats.ttest_ind(Population,ShelterCensusMerge.DogEuth.astype(np.float), equal_var=False)
```

```
Ttest_indResult(statistic=35.39240900552823, pvalue=2.2885455769660452e-174)
```

Results

Hypothesis : In areas of higher population, we expect to see a higher number of animals received and adopted through animal shelters.

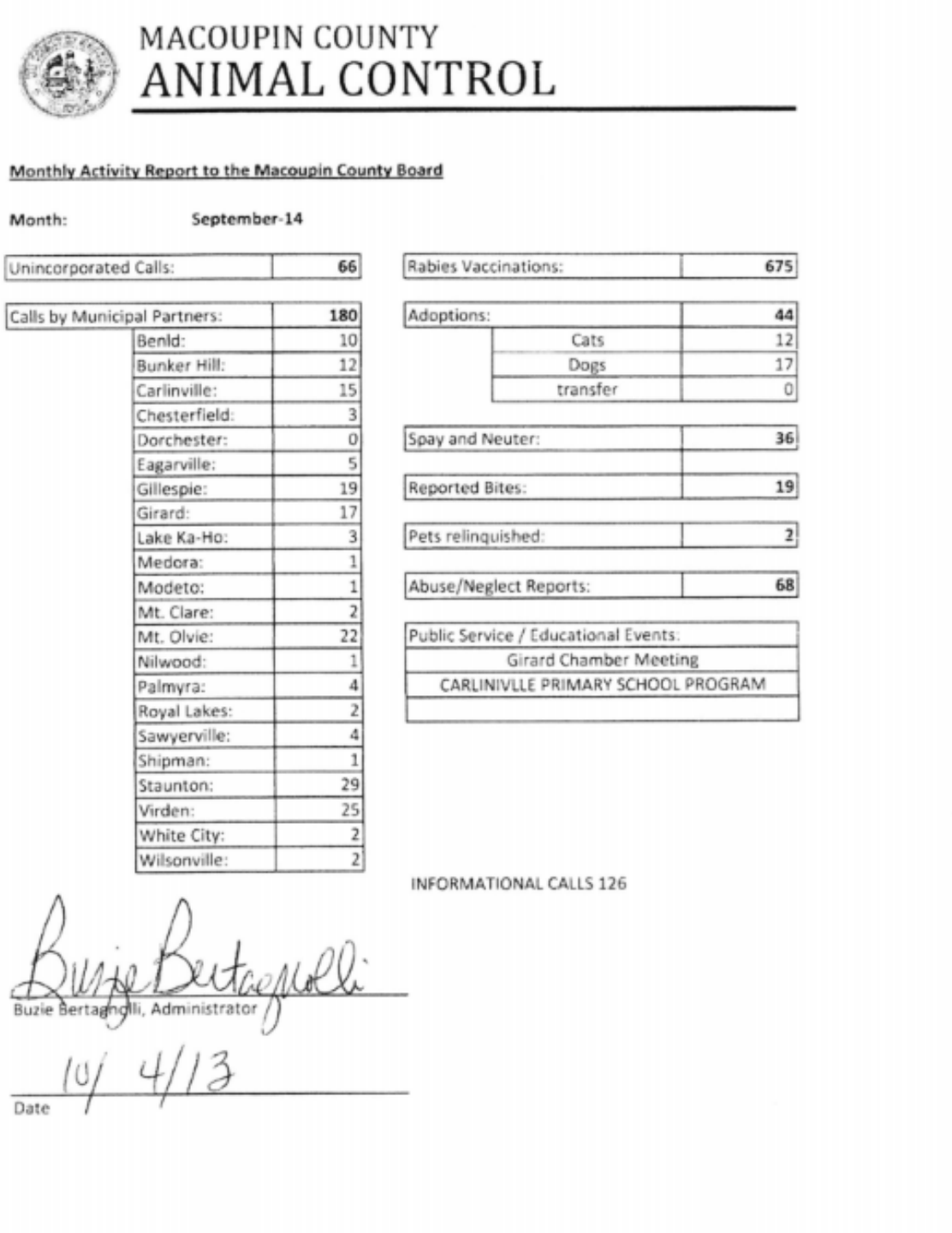
Null Hypothesis : There should be no correlation between population and amount of animals received and adopted through animal shelters.

Result : With a p-values greater than 1, the p-values are very high, meaning we reject our hypothesis and accept the null hypothesis – there is no correlation between population and volume of animals.

Addendum 1: It turns out Macoupin County's Animal Control Department had a Monthly Report that was delivered to the County Board.

Only the County Board FOIA officer, who is also the County Clerk that oversees publication of the County Board meeting minutes had never of it.

Over a dozen FOIA requests with a formal complaint and appeal made with the Illinois Attorney General's Office later...



MACOUPIN COUNTY
ANIMAL CONTROL

Monthly Activity Report to the Macoupin County Board

Month: **September-14**

Unincorporated Calls:	66

Calls by Municipal Partners:	180
Benld:	10
Bunker Hill:	12
Carlinville:	15
Chesterfield:	3
Dorchester:	0
Eagarville:	5
Gillespie:	19
Girard:	17
Lake Ka-Ho:	3
Medora:	1
Modeto:	1
Mt. Clare:	2
Mt. Olvie:	22
Nilwood:	1
Palmyra:	4
Royal Lakes:	2
Sawyerville:	4
Shipman:	1
Staunton:	29
Virden:	25
White City:	2
Wilsonville:	2

Rabies Vaccinations:	675

Adoptions:	44
Cats	12
Dogs	17
transfer	0

Spay and Neuter:	36

Reported Bites:	19

Pets relinquished:	2

Abuse/Neglect Reports:	68

Public Service / Educational Events:
Girard Chamber Meeting
CARLINIVLLE PRIMARY SCHOOL PROGRAM

INFORMATIONAL CALLS 126

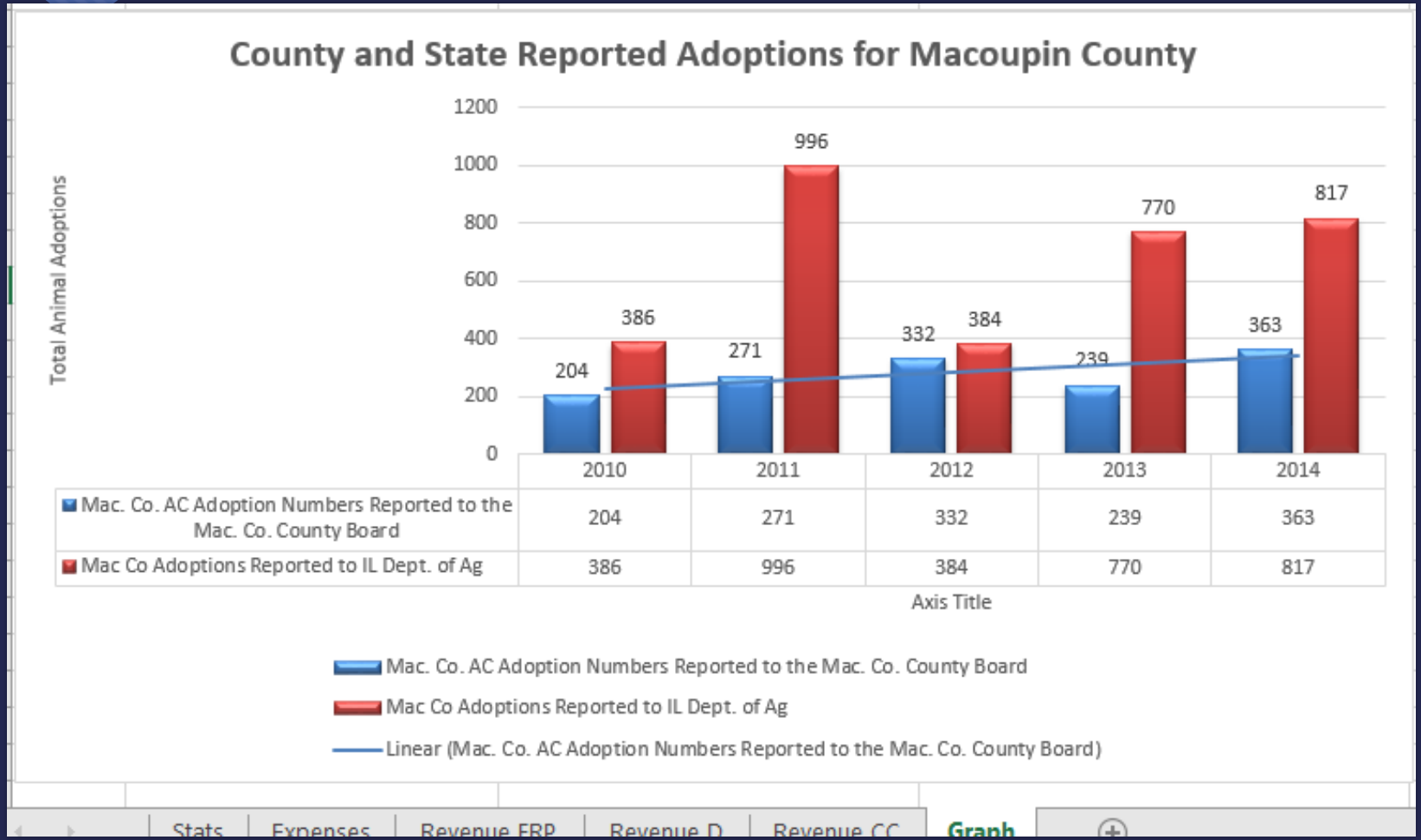
Buzie Bertagnolli

Buzie Bertagnolli, Administrator

10/ 4/13

Date

Addendum 2: County vs State Adoptions



Addendum 3: The Good…

Andrew Woesthaus is the new Animal Control Department Director for Macoupin County.

Addendum 4: The Ugly…

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Veryl Reiher, Board Member
SECONDER:	Robert Quarton, Board Member
AYES:	Armour, Dragovich, Harding, Kiel, Long, Petrak, Pomatto, Quarton, Reiher, Starr, Thomas, Tranter, Wieseman, Wiggins
ABSENT:	Brown, Lewis, Rull, Watson

Resolution Amending the Animal Control Special Fund Appropriations

Clerk Duncan stated that this resolution would increase the Animal Control Special Fund by $43,000, furthermore, at written request by the County Board, the County Clerk would cut a check to the previous Animal Control Administrator, Buzie Bertagnolli, as compensation for her accrued time off.

Motion by Long, seconded by Quarton to adopt the Resolution Amending the Animal Control Special Fund Appropriations. Roll Call vote: