

USFWS National
Bicycle & Pedestrian
Counting Program

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Kimley-Horn and Associates, Inc.

Background

- Are we experiencing an increase in visitors that are using a wildlife refuge for biking and hiking?
- The staff says, “yes, it appears so.”
- The data says...

Background

- USFWS National Bicycle and Pedestrian Counting Program
- A joint project between U.S. Fish and Wildlife Service and FHWA Office of Federal Lands Highway
- Goal is *“To gather enhanced visitor movement information upon which FWS can make informed decisions on investments needed to expand and improve existing bicycle and pedestrian elements.”*

Counting Program

- Phase 1
 - Install bicycle and pedestrian counters
 - Start collecting data
- Phase 2
 - Analyze data
 - Set national level priorities and goals for access, mobility, and connectivity
 - Address how individual stations can meet goals

Phase 1

- Selecting wildlife refuge stations for program
- Selecting individual facilities (trails or roads) to count
- Selecting type of counters to use

Selecting Stations

- Get input from headquarter, regional, and local levels
- Look for stations with high visitation
- Look for stations with connections to other local or regional facilities
- Look for stations with recent improvements
- You have to start somewhere...

Selecting Stations

Ankeny (OR)
Deer Flat (ID)
Steigerwald Lake (WA)
Kootenai (ID)
Bosque Del Apache (NM)
Minnesota Valley (MN)
Upper Mississippi River
(IL)
Shiawassesee (MI)
Neal Smith (IA)
Trempealeau (WI)
Merritt Island (FL)
Loxahatchee (FL)
St. Marks (FL)
Hobe Sound (FL)

Cabo Rojo (PR)
John Heinz (PA)
Assabet River (MA)
Eastern Shore of Virginia
(VA)
Montezuma (NY)
Great Dismal Swamp (VA)
Bear River Migratory Bird
(UT)
Rocky Mountain Arsenal
(CO)
Don Edwards San
Francisco Bay (CA)

Selecting Facilities

- Get input from local staff
- Look for facilities that are easy for staff to access
- Look for popular trails
 - Crowdsourcing from Strava Heatmap
 - <http://labs.strava.com/heatmap/>

Selecting Facilities



Selecting Counters

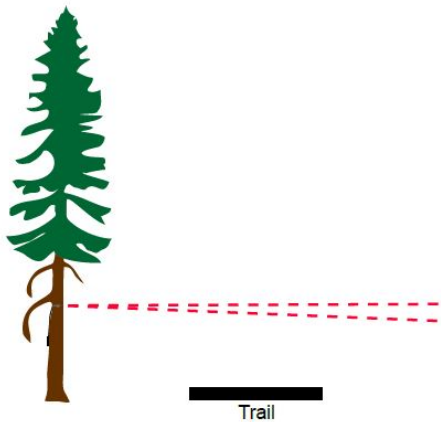
- TRAFx
 - Based in Alberta Canada
 - Specialty is counting solutions for rugged, rural, and remote areas
- Eco-Counter
 - Based in France with distributors throughout North America
 - Specialty is counting solutions for pedestrians and cyclists in cities

Selecting Counters

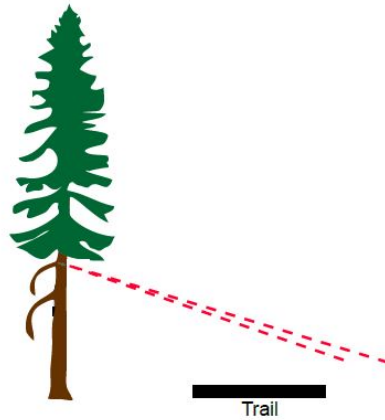
- Is the refuge currently using vehicle counters?
- Are neighboring agencies currently using bike/ped counters?
- Which counters fit best within normal daily operations?
- In general, TRAFx feels rural and Eco-Counter feels urban.

TRAFx Trail Counter

POINT ACROSS



POINT DOWN



TRAFx Trail Counter



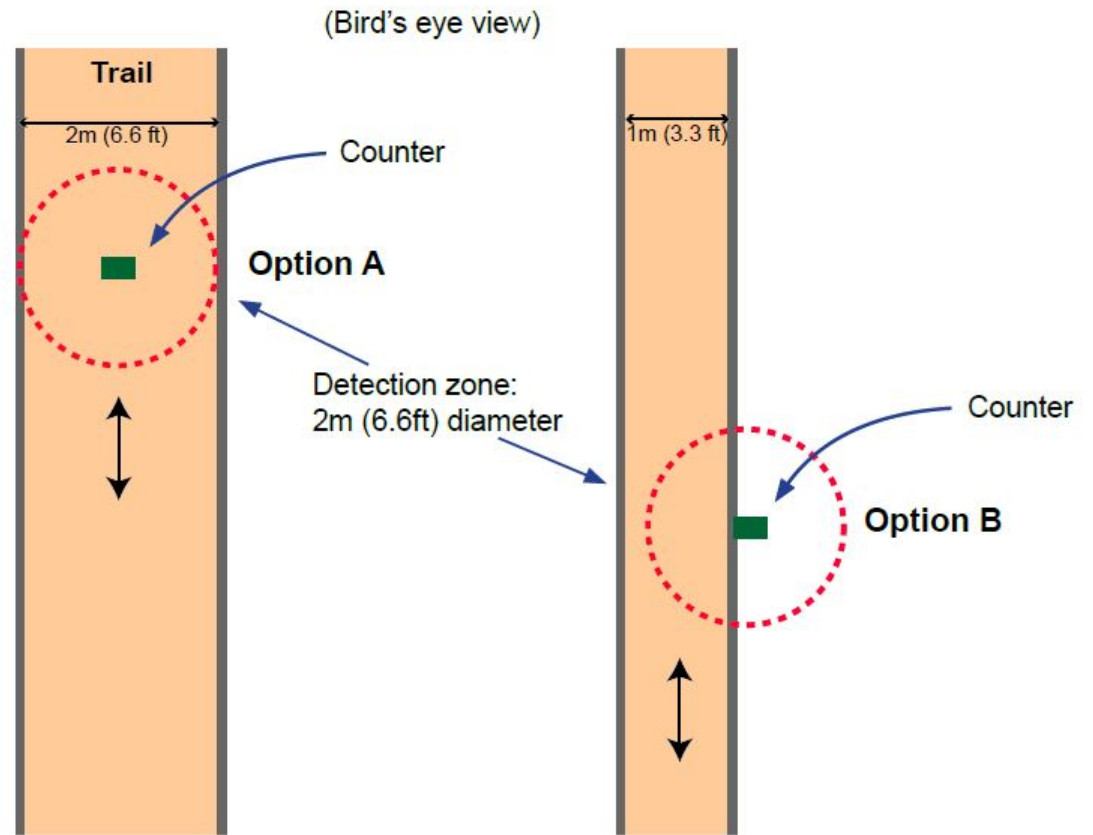
TRAFx Trail Counter



TRAFx Trail Counter



TRAFx Bike Counter



TRAFx Bike Counter



TRAFx Bike Counter



Eco-Counter Pyro Box



Eco-Counter Pyro Box



Eco-Counter Pyro Box



Eco-Counter Multi



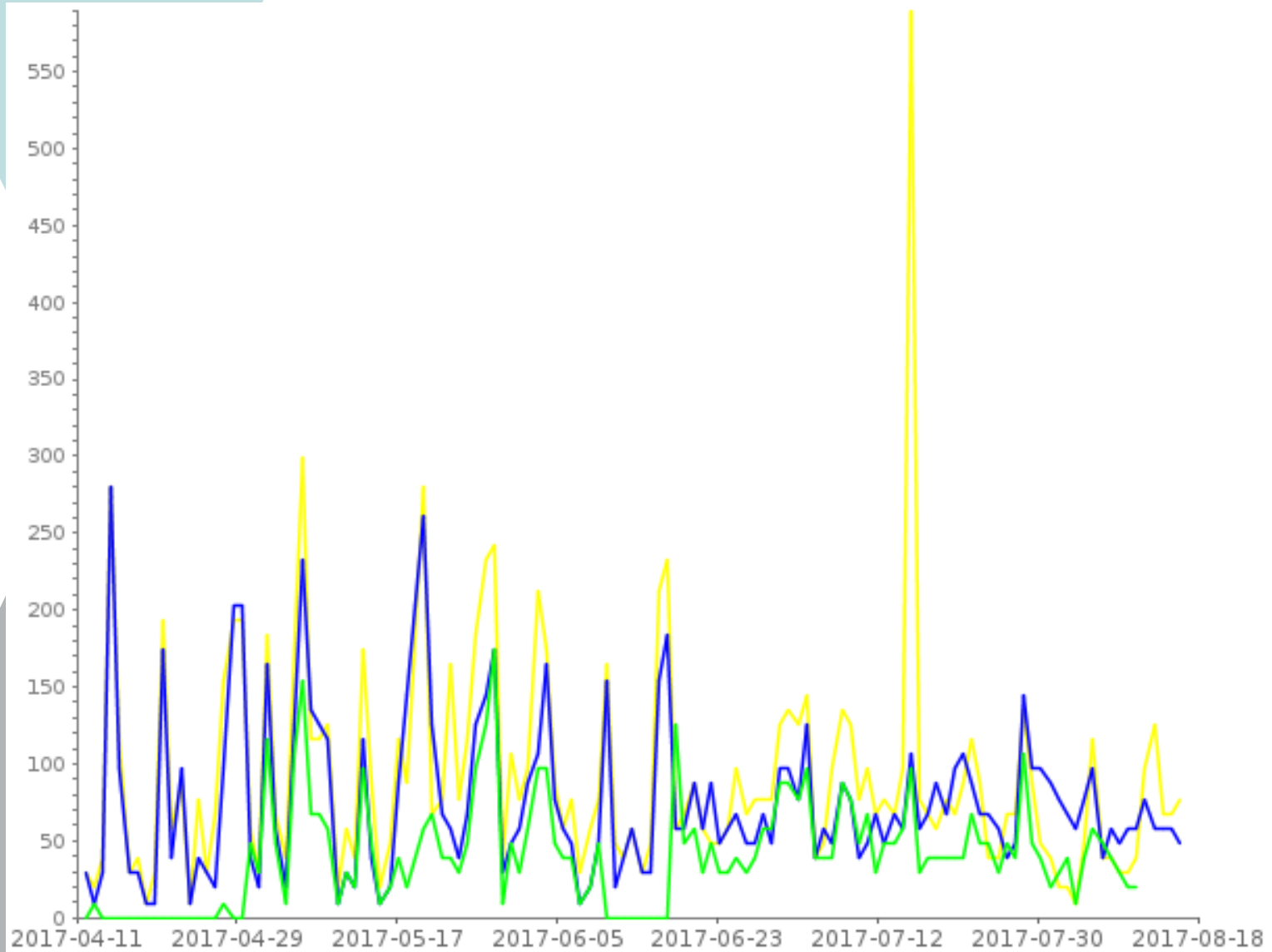
Eco-Counter Multi



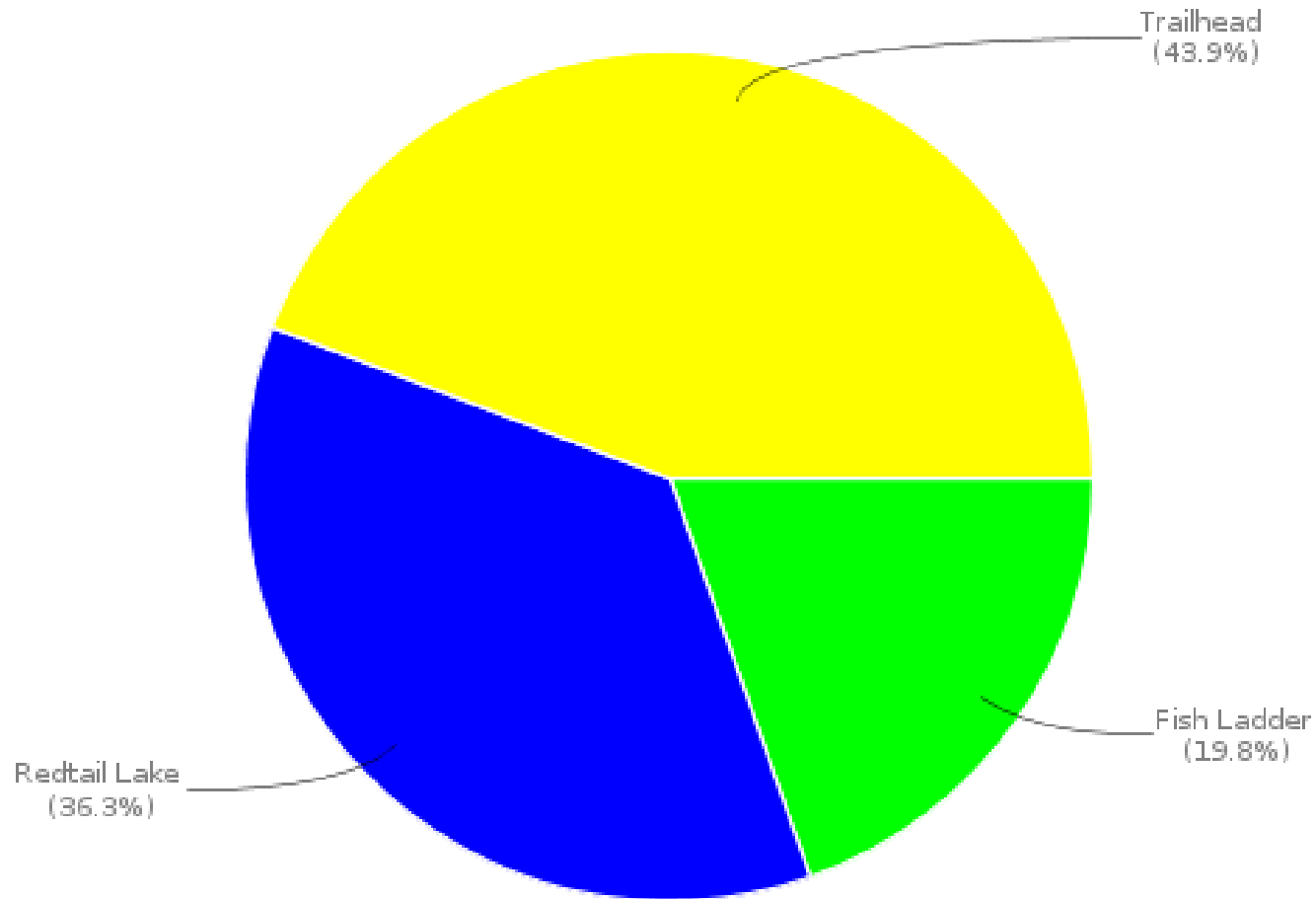
Preliminary Count Data

- Steigerwald Lake NWR
 - Installed TRAFx trail counters
 - Collected data from April 11 to August 12
- Minnesota Valley NWR
 - Installed Eco-Counter Pyro Box and Multi
 - Collected data from June 1 to August 31

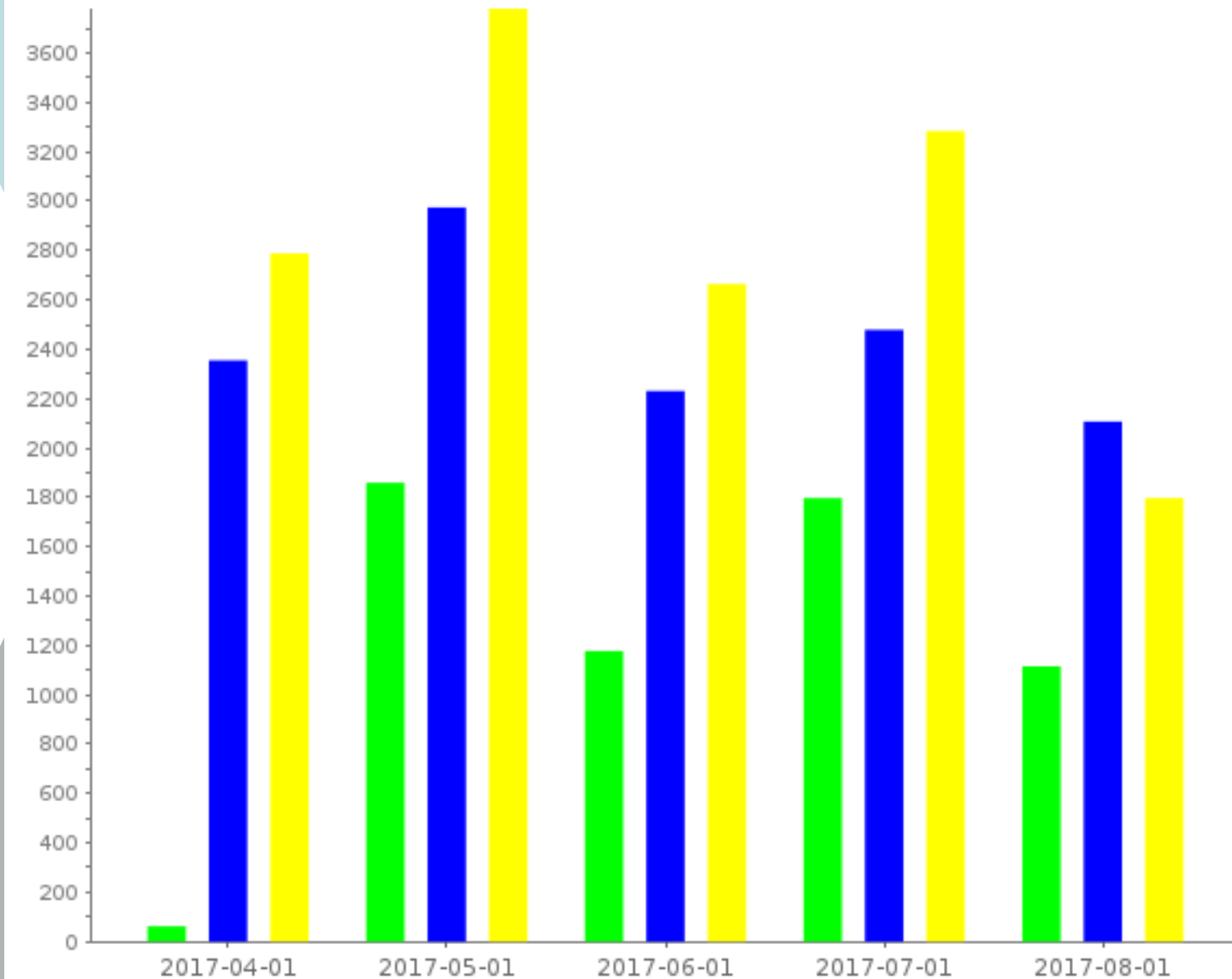
Steigerwald Lake NWR



Steigerwald Lake NWR

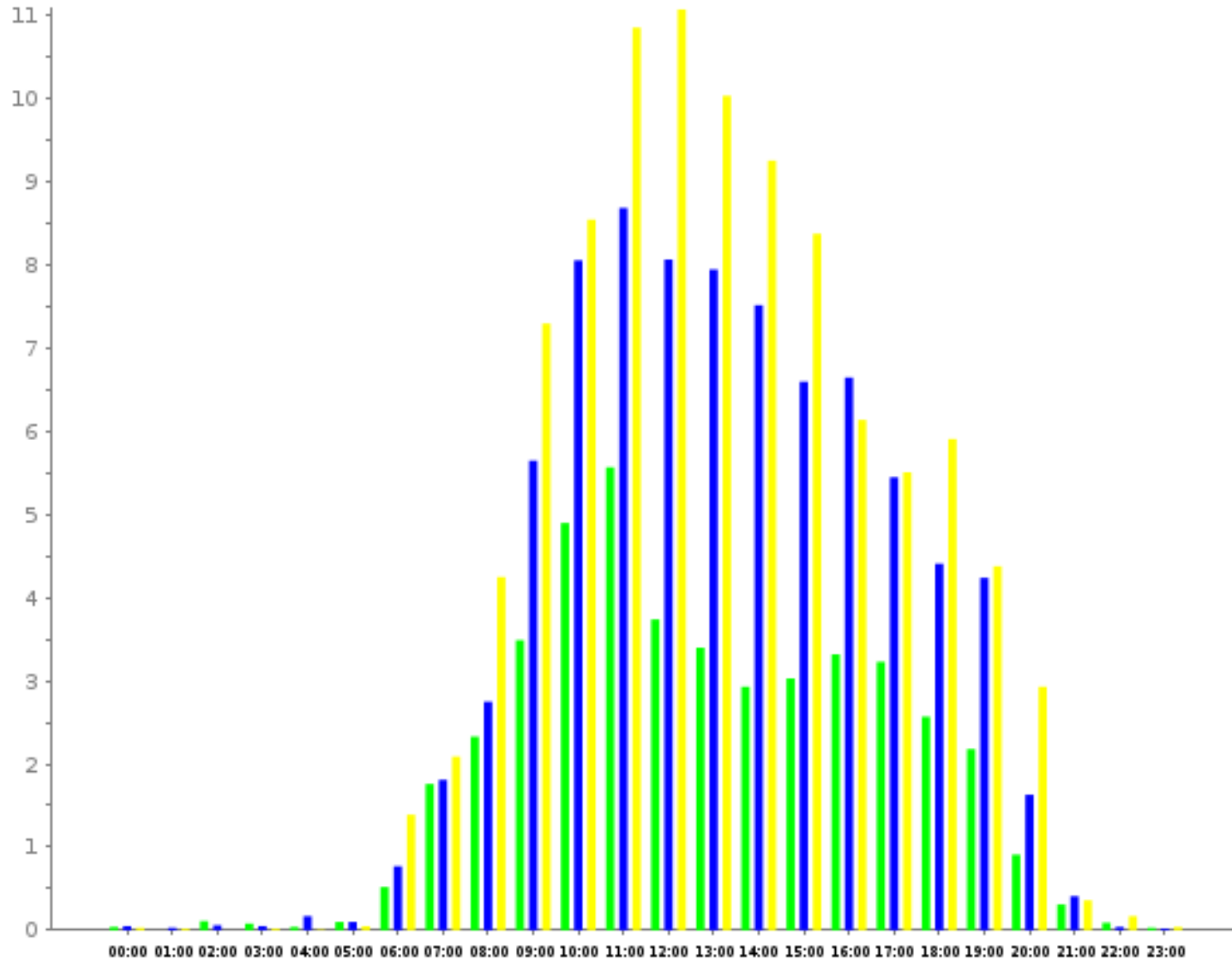


Steigerwald Lake NWR



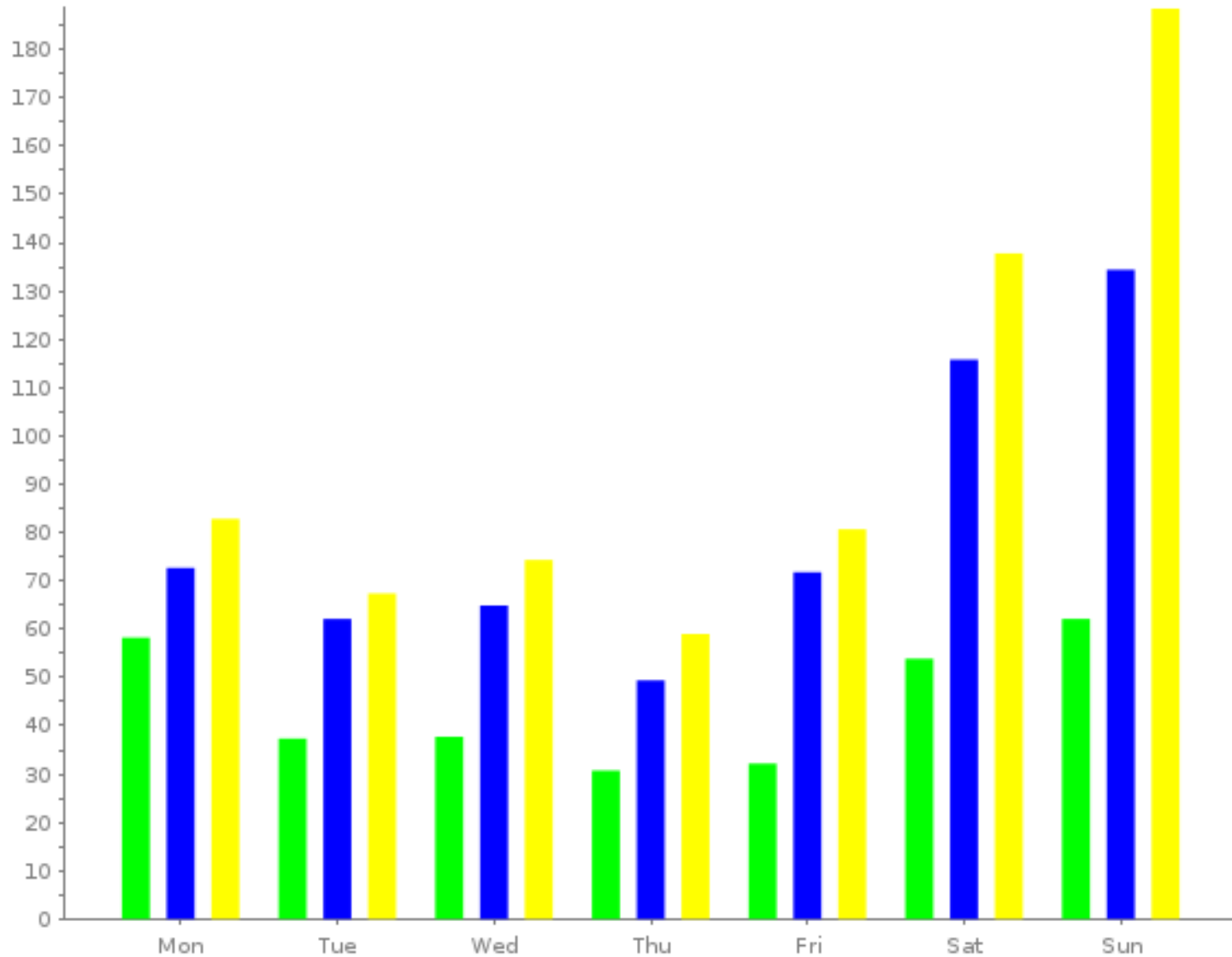
Steigerwald Lake NWR

Hourly averages



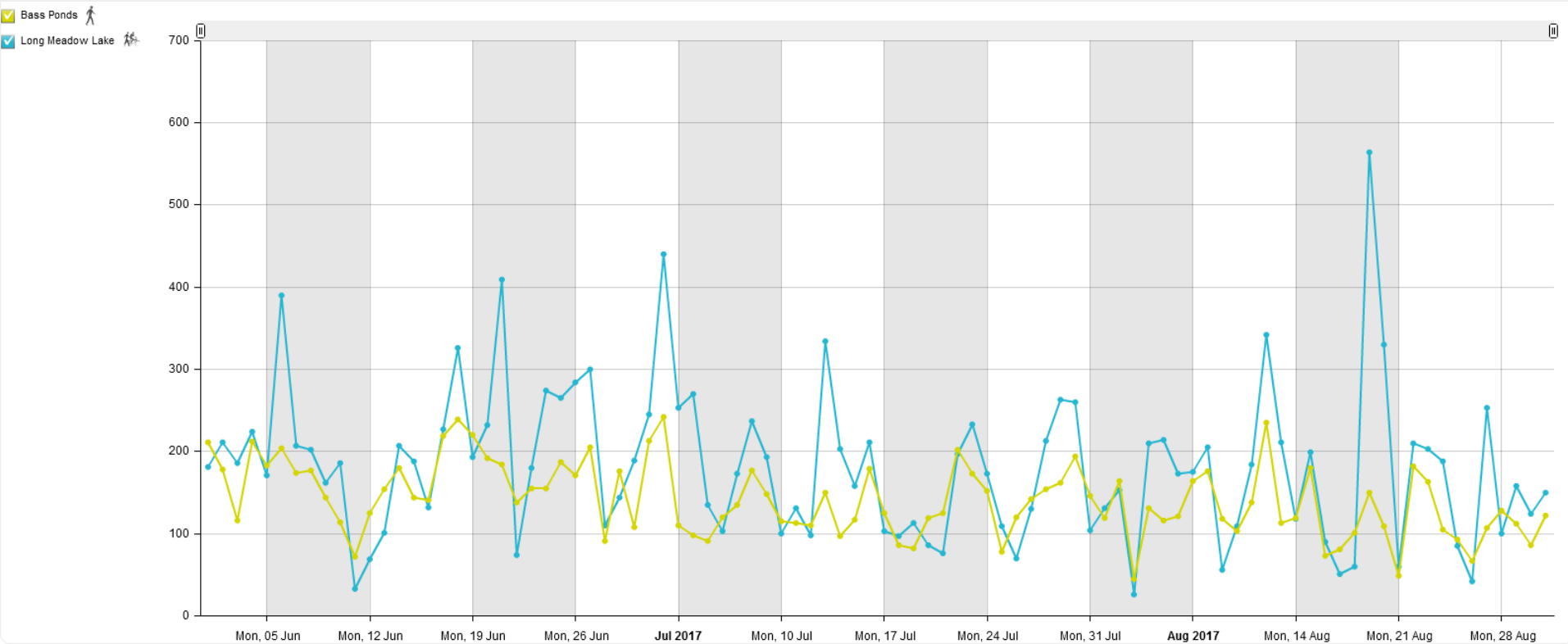
Steigerwald Lake NWR

Daily averages

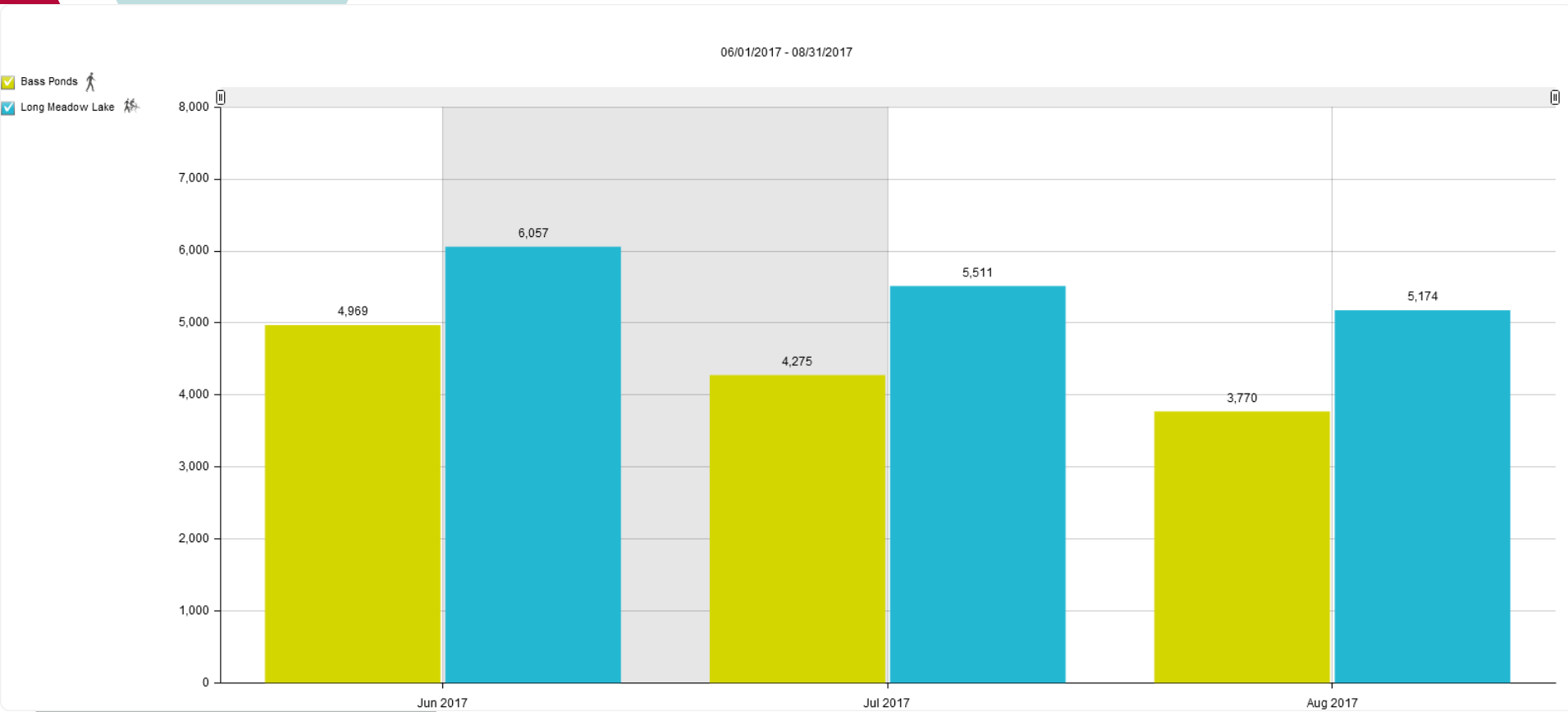


Minnesota Valley NWR

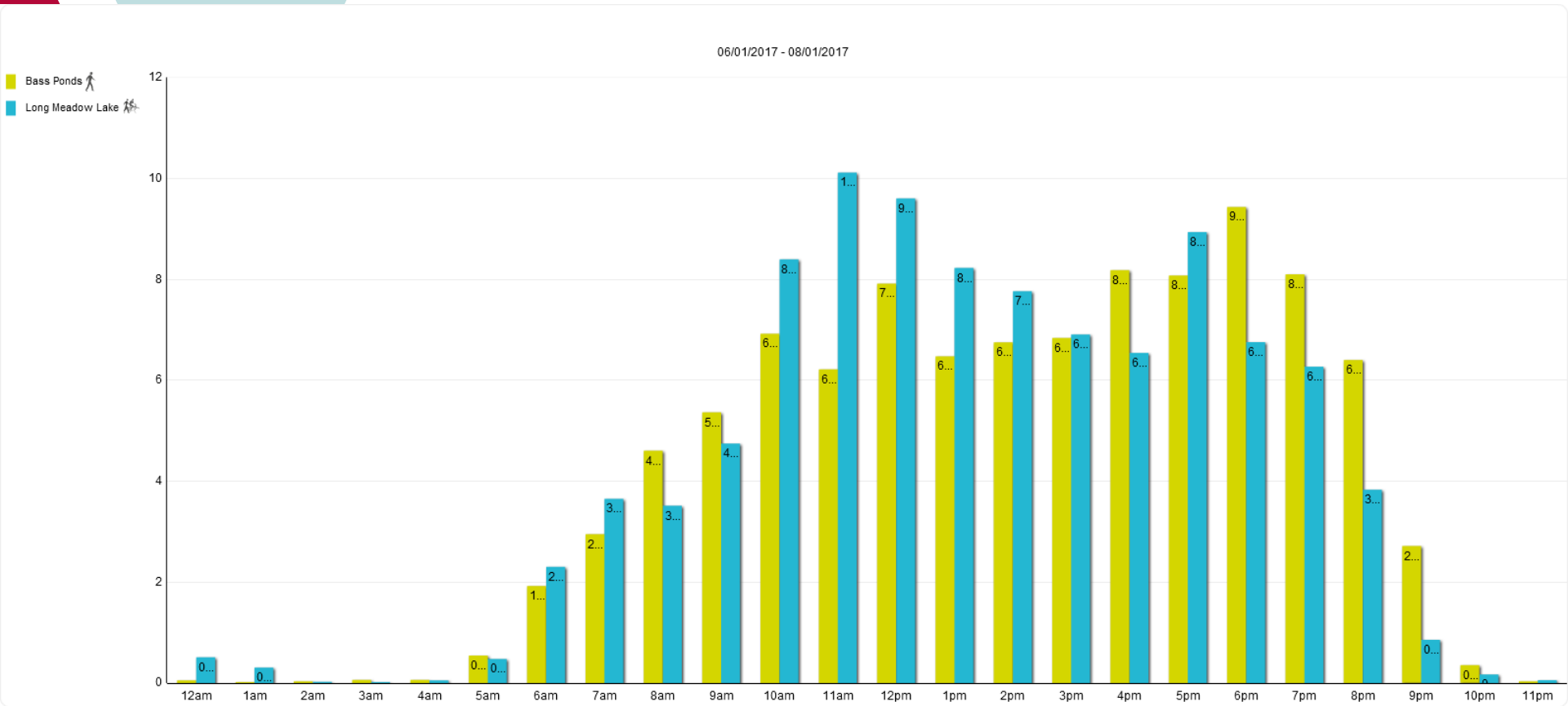
	Bass Ponds	Long Meadow Lake
Total	13,014	16,742
Peak Day	Sun, 2 Jul, 2017 (242)	Sat, 19 Aug, 2017 (564)
Minimum Day	Thu, 3 Aug, 2017 (45)	Thu, 3 Aug, 2017 (26)
Max Day of the Week	Sunday	Sunday
Hourly Average	6	8
Daily Average	141	182
Average Workday Traffic	134	158
Average Weekend Traffic	159	242
Weekly Average	990	1,274
Monthly Average	4,306	5,539



Minnesota Valley NWR

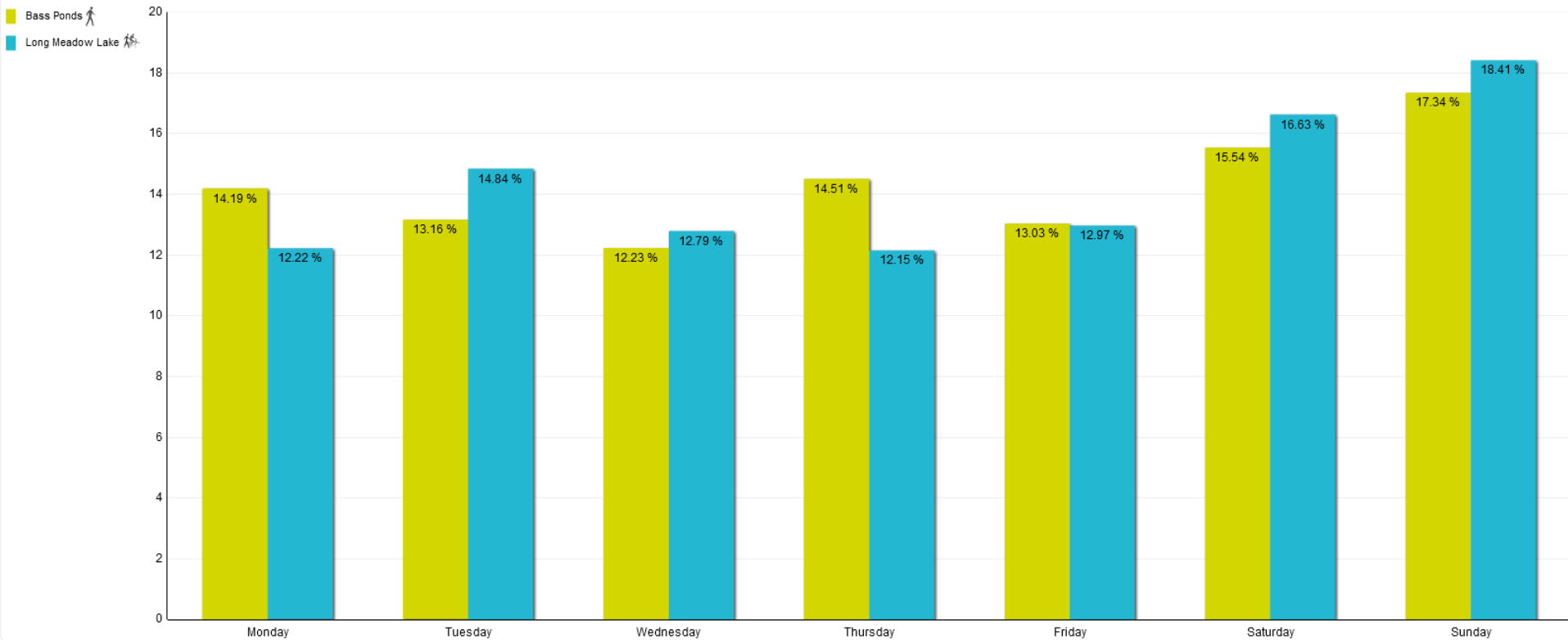


Minnesota Valley NWR



Minnesota Valley NWR



06/01/2017 - 08/01/2017

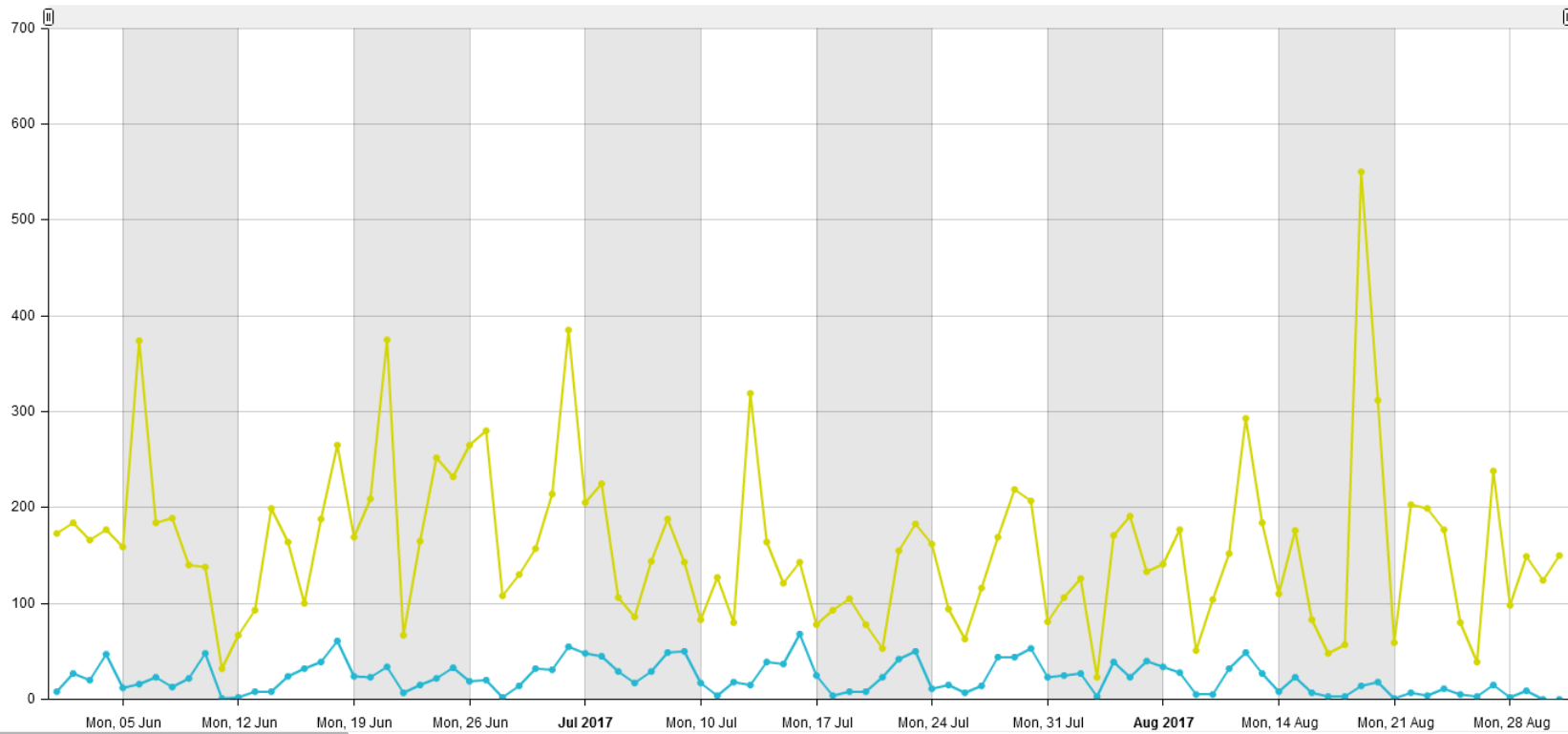


Minnesota Valley – Bike/Ped

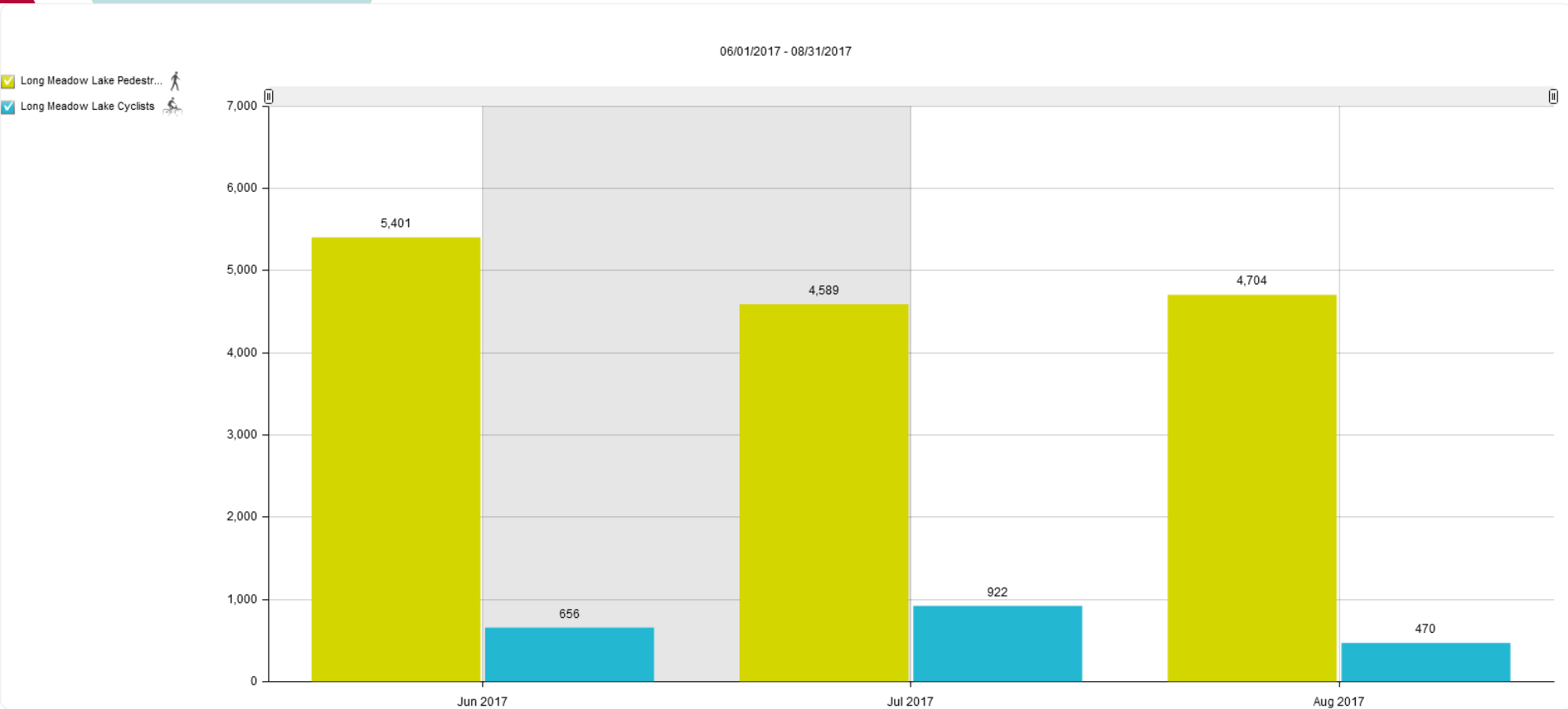
	Long Meadow Lake Pedestrians	Long Meadow Lake Cyclists
Total	14,694	2,048
Peak Day	Sat, 19 Aug, 2017 (550)	Sun, 16 Jul, 2017 (68)
Minimum Day	Thu, 3 Aug, 2017 (23)	Wed, 30 Aug, 2017 (0)
Max Day of the Week	Saturday	Sunday
Hourly Average	7	1
Daily Average	160	22
Average Workday Traffic	142	17
Average Weekend Traffic	206	36
Weekly Average	1,118	156
Monthly Average	4,861	678

06/01/2017 - 08/01/2017

- Long Meadow Lake Pedestr... 
- Long Meadow Lake Cyclists 





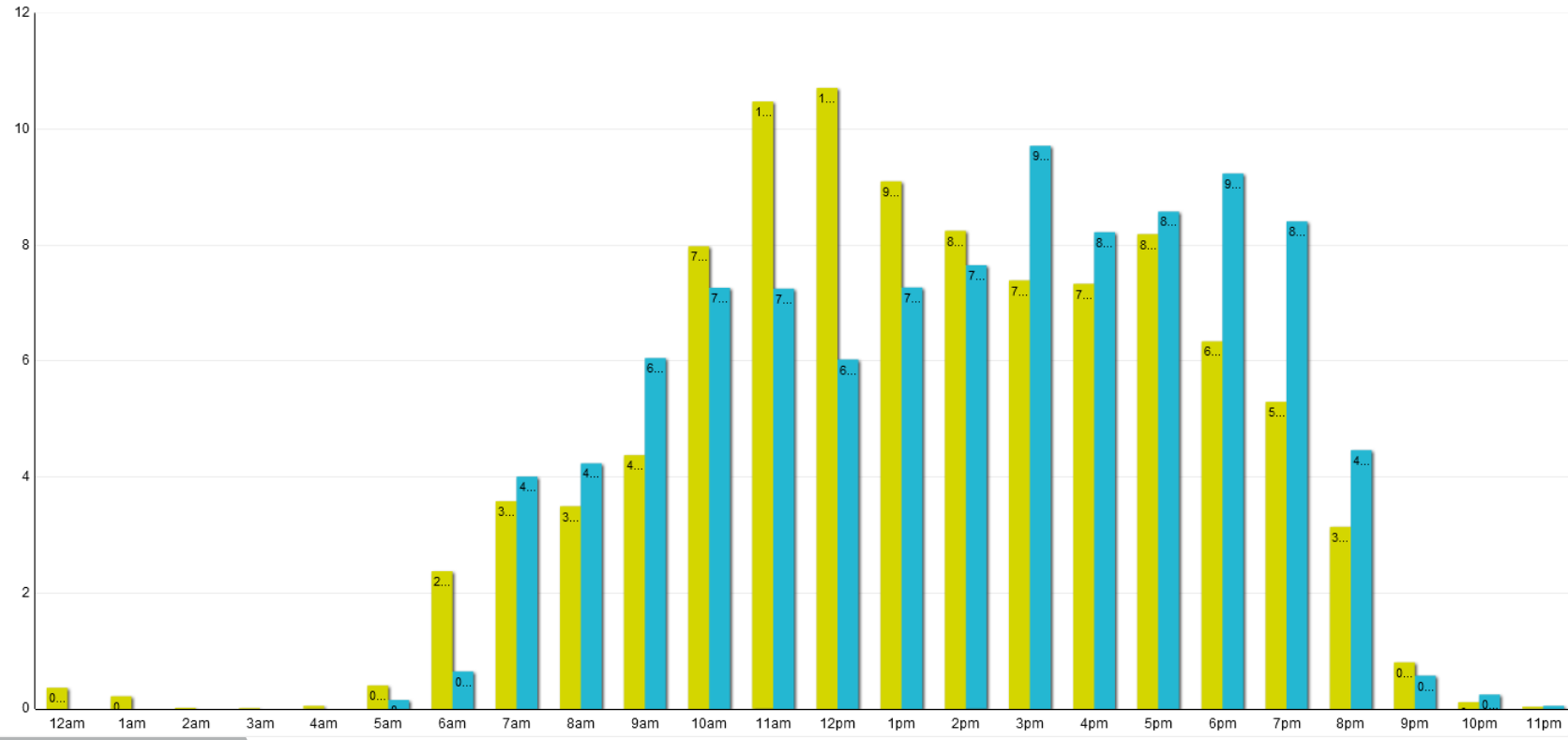
Minnesota Valley – Bike/Ped



Minnesota Valley – Bike/Ped



06/01/2017 - 08/31/2017

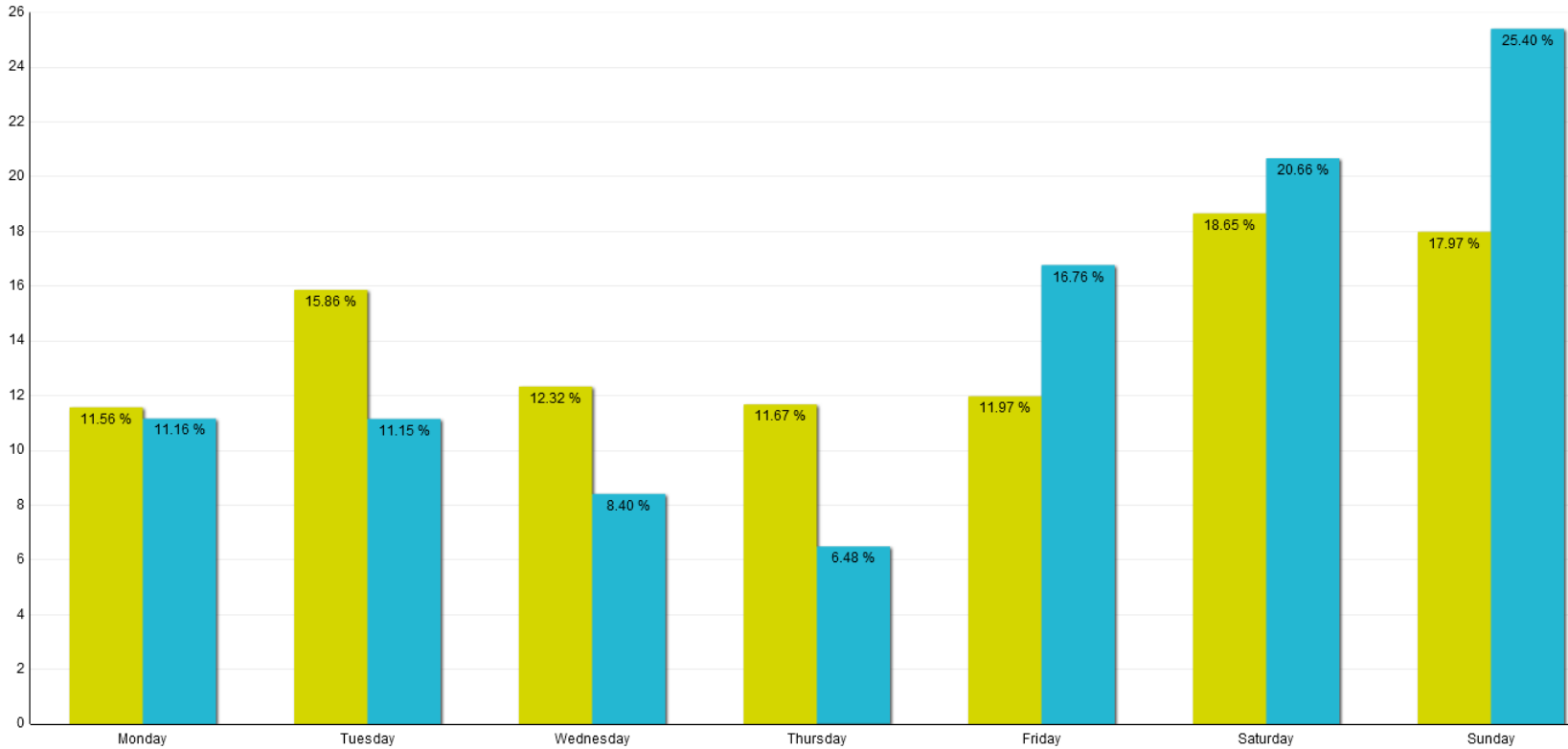
Long Meadow Lake Pedestrians 
Long Meadow Lake Cyclists 



Minnesota Valley – Bike/Ped

06/01/2017 - 08/31/2017

Long Meadow Lake Pedestrians 
Long Meadow Lake Cyclists 



Lessons Learned

- Refuge staff are busy
- You need a champion
- Be creative
- Count data can't tell the whole story
- A refuge is part of a larger community

Contact Information

- Kevin Smith – Kimley-Horn
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- Nathan Caldwell – USFWS
nathan_caldwell@fws.gov
- Chris Jaeschke – FHWA EFLHD
christoph.jaeschke@dot.gov



TRAFx Trail Counter

- Infrared sensor that detects changes in heat
- Detection range up to 20 feet
- Battery life of 3-4 years (3xAA)
- Temperature range of -40° F to 131° F
- Stores up to 18 months of hourly data

TRAFx Bike Counter

- Magnetometer that detects changes in its electromagnetic environment
- Detection range of 3-4 feet
- Battery life of 7-8 months (3xC)
- Temperature range of -40° F to 131° F
- Stores up to 18 months of hourly data

TRAFx Dock

- Standalone device for downloading and configuring counters
- Battery life of 4-5 years (3xAAA)
- Temperature range of -4° F to 140° F
- Stores up to 375 months of data from multiple counters

TRAFx Dock



TRAFx DataNet

- Web-based application for storing and analyzing count data
- Organizes counting sites to quickly see count data, photos, maps, GPS, etc.
- Generates user-defined count totals, charts, reports, tables, etc.
- No limit on number of counters or amount of data
- Allows up to 5 unique users

TRAFx DataNet

TRAFx DataNet - Home - Mobile View

File Edit View History Bookmarks Tools Help
http://www.trafx.net/datanet/

Logged in as: gvan@ecorpc.com
Organization: Ecotank Inc., Ecotank
Subscription Expires: 2027-01-01

HOME ANALYZE UPLOAD MANAGE ADMIN HELP

Welcome to DataNet!
A smarter way to analyze, manage, store and share your TRAFx data.

Your counter sites ... click below to explore
Sort by: Site name

#	Site name	Last 12 months	View	Report	Photo	Image 2
1	Boardwalk Trail (IR)					
2	Grass Lakes Access Road (VEH)					
3	Harvie Heights Multiuse Path (IR)					
4	Highway - 1A (VEH)					

Counter map (beta)

Additional mapping options

- To link to a Google satellite image showing a counter's location, click a marker above.
- To download all counter locations as a KML file viewable with Google Earth, [click here](#). [Learn more.](#)

Boardwalk Trail (IR)
Site report from 2005-01-01 to 2010-01-01
Made by: gvan@ecorpc.com on 2009-10-10 13:09:15 (UTC-07:00)
Made with: TRAFx DataNet (0.9.9.9) 2005-01-01
Acquire factor (1): Divis 2 (loc. filter 0)

Weekly total*

Daily*

Day	Percentage
Sa (28.0%)	28.0%
Su (29.6%)	29.6%
Mo (3.9%)	3.9%
Tu (14.1%)	14.1%
Th (2.9%)	2.9%
Fr (7.2%)	7.2%

Avg daily traffic: 21.6

Hourly*

Monthly*

Yearly*

Year	Traffic
2009	11.6
2008	20.4
2007	20.4
2006	20.4
2005	20.4

Master Summary

Year	Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan/01	Days	Traffic	
2009	Class Lakes Access Road (VEH)	10	12	15	18	22	25	28	32	35	38	42	45	48	18.5	365	1,300
	Boardwalk Trail (IR)	15	18	22	25	28	32	35	38	42	45	48	52	55	19.5	365	7,171
	Class Lakes Access Road (VEH)	20	22	25	28	32	35	38	42	45	48	52	55	58	19.5	365	6,742
	Highway - 1A (VEH)	30	35	40	45	50	55	60	65	70	75	80	85	90	60.0	365	21,565
2008	Class Lakes Access Road (VEH)	10	12	15	18	22	25	28	32	35	38	42	45	48	18.5	365	1,300
	Boardwalk Trail (IR)	15	18	22	25	28	32	35	38	42	45	48	52	55	19.5	365	7,171
	Class Lakes Access Road (VEH)	20	22	25	28	32	35	38	42	45	48	52	55	58	19.5	365	6,742
	Highway - 1A (VEH)	30	35	40	45	50	55	60	65	70	75	80	85	90	60.0	365	21,565
2007	Class Lakes Access Road (VEH)	10	12	15	18	22	25	28	32	35	38	42	45	48	18.5	365	1,300
	Boardwalk Trail (IR)	15	18	22	25	28	32	35	38	42	45	48	52	55	19.5	365	7,171
	Class Lakes Access Road (VEH)	20	22	25	28	32	35	38	42	45	48	52	55	58	19.5	365	6,742
	Highway - 1A (VEH)	30	35	40	45	50	55	60	65	70	75	80	85	90	60.0	365	21,565
2006	Class Lakes Access Road (VEH)	10	12	15	18	22	25	28	32	35	38	42	45	48	18.5	365	1,300
	Boardwalk Trail (IR)	15	18	22	25	28	32	35	38	42	45	48	52	55	19.5	365	7,171
	Class Lakes Access Road (VEH)	20	22	25	28	32	35	38	42	45	48	52	55	58	19.5	365	6,742
	Highway - 1A (VEH)	30	35	40	45	50	55	60	65	70	75	80	85	90	60.0	365	21,565

Days of the week

Photo

TRAFx Costs

- System Package – about \$2,500
 - 3 counters of your choice
 - 1 dock and all cables
 - 5 year license for DataNet
- Additional counters are about \$550 each

Eco-Counter Pyro Box

- Passive infrared sensor that can determine direction of travel
- Detection range options of 4, 15, or 50 feet
 - Can be configured to detect in multiple directions using two sensors
- Battery life of 10 years (proprietary lithium)
- Temperature range of -40° F to 130° F
- Store up to 18 months of data

Eco-Counter Multi

- Pedestrian Counter
 - Range options of 4, 15, or 50 feet
 - Battery life of 10 years
- Bicycle Counter
 - Preformed loops from 5 to 20 feet wide
 - Battery life of 1 to 2 years
- Temperature range of -40° F to 104° F
- Store up to 20 months of data

Eco-Counter Eco Link

- Software for Windows Laptops or Android Devices
- Uses Bluetooth communications to download data from counters

Eco-Counter Eco Link



The screenshot shows the Eco-Link interface with a search filter and a table. The interface includes a home icon, a refresh icon, and the 'eco link' logo. A search bar is present with the text 'Filter:'. Below the search bar are two buttons: 'Search' and 'Clear List'. The table has three columns: 'Serial Number', 'Name', and 'Last Connection'. The first row is highlighted in yellow and contains the following data:

Serial Number	Name	Last Connection
X2I17011426	Lake Johnson Multi	8/18/2017 07:02:07



The screenshot shows the Eco-Link interface with a list of data sent and a file manager. The interface includes a home icon, a refresh icon, and the 'eco link' logo. On the left side, there are two buttons: 'Synchronize All' and 'File Manager'. The table has four columns: 'Data sent', 'Name', 'Serial Number', and a chart icon. The first row is highlighted in yellow and contains the following data:

Data sent	Name	Serial Number	Chart
✓	Lake Johnson	XSI17031867	[Line Chart]
✓	Lake Johnson Multi	X2I17011426	[Line Chart]
✓	Bass Ponds	XSI17031860	[Line Chart]
✓	Long Meadow Lake	X2I17031858	[Line Chart]

Eco-Counter Eco Visio

- Web-based application for storing and analyzing count data
- Generates reports, graphs, and charts
- No limit on number of counters or users

Eco-Counter Eco Visio



eco counter
COUNTING PEOPLE. ANALYSING DATA.

Hawthorne totem

Period Analyzed: Wednesday 15 May 2013 to Thursday 15 May 2014



eco counter
COUNTING PEOPLE. ANALYSING DATA.



Key Figures

- Total Traffic for the Period Analyzed: 1,675,160
- Daily Average : 4,589
- Monthly Average: 128,858
- Busiest Day of the Week : Tuesday
- Busiest Days of the Period Analyzed:
 1. Saturday 08 June 2013 (9,834)
 2. Tuesday 13 August 2013 (8,452)
 3. Wednesday 14 May 2014 (8,395)

Eco-Visio Demo Account

Eco Counter

Analyses Selection (3)

- User Type
- Pedestrians/Cyclists (4)
- Pedestrians (4)
- Cyclists (4)
- Type
- Automatic Transmission (199)
- Manual Data Retrieval (26)
- Virtual Counter (11)
- Tags
- Permisssion Counters (147)
- Trail Counters (100)
- Mobile Counters (84)
- Downtown Counting (63)
- In-Center Counting (27)

Sort By: Name

SELECT ALL | UNCHECK ALL

Item	Remaining Warranty	Address	Daily	Serial Number	Last Data
<input type="checkbox"/> MULTI on trail (4)	5 month(s)	1,668	12/07/2012	Y2012112974	06/17/2015
<input type="checkbox"/> PYRO on Trail (2)	13 month(s)	732	07/19/2013	UM503053727	06/17/2015
<input type="checkbox"/> PYRO-Box - Low Traffic Downtown (2)	8 years	2,047	11/02/2013	YU014055719	06/17/2015

direction:

Direction	Percentage
Yellow	49%
Grey	51%

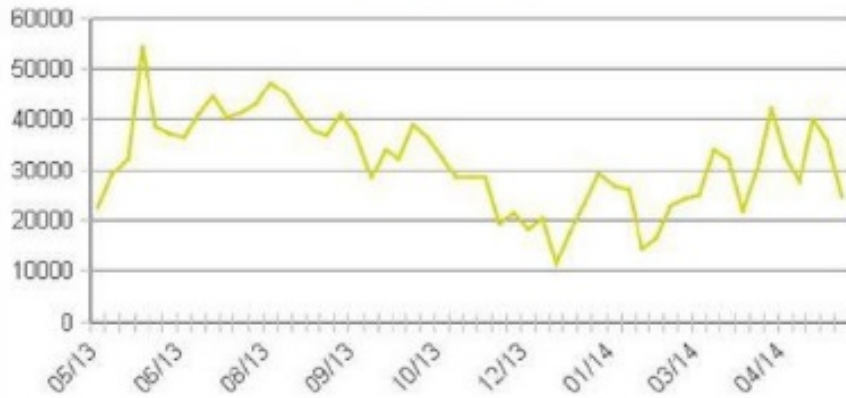
Eco-Counter Eco Visio



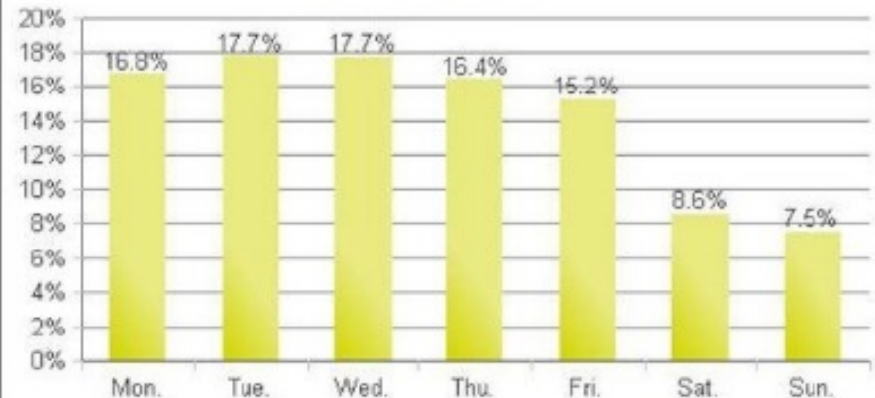
Yearly Trend on Main Corridor
 Period Analyzed: Wednesday 15 May 2013 to Thursday 15 May 2014



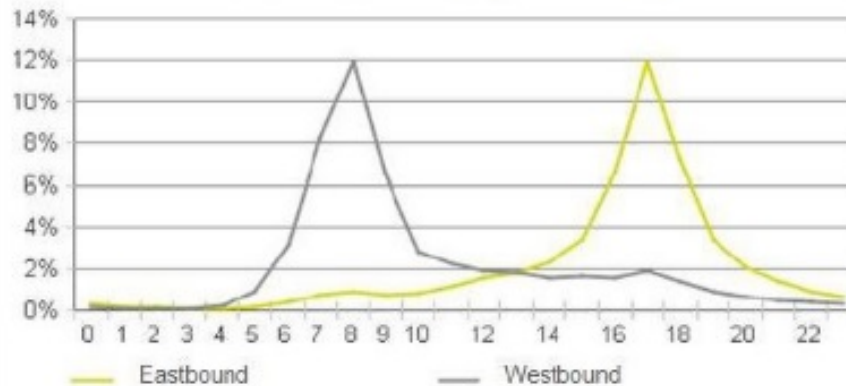
Weekly Traffic



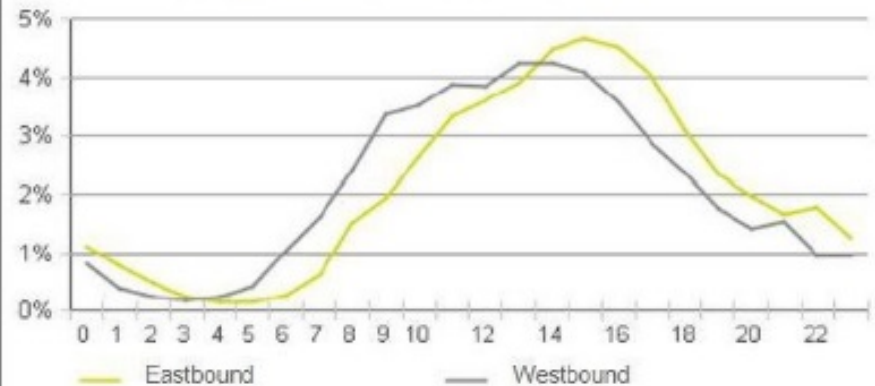
Weekly Profile



Hourly Profile during Weekdays



Hourly Profile during the Weekend



Eco-Counter Costs

- Pyro Box is about \$4,000
- Multi counter is about \$6,000
- No costs for Eco Link and Eco Visio software