Ten Mile Lake AIS Inspection Report

The analysis of Ten Mile Lake launch Internet-Landing Installed Device Sensor (I-LIDS) video clips and volunteer inspector sheets from the summer of 2012 provides valuable information about watercraft use. Through frequency analysis of events recorded on volunteer sheets and variables designed to quantify activity within video captures, general trends were ascertained of the users of Ten-mile Lake for the four peak months of the boating season. This analysis enables the quantification of the number of boats using the public access, the origin of these boats, their potential for transporting aquatic invasive species, and the level of invasive species awareness among Ten Mile Lake patrons. Taken together, these factors describe activity on the lake as well as possible causes for concern.

Number of Watercraft

The I-LIDS system captured a total of 5,623 video clips, 3,967 of which were either false alarms or repeat videos of a single watercraft. This left 1,656 unique watercraft entries (29% of total video clips). Boat launches were quantified by week, day of week, and time of day to display the most active times at the public access. Launches peaked during the week of July first through the seventh, with I-LIDS capturing 240 unique watercrafts during this period. Activity fell sharply the next week and gradually decreased throughout the remainder of the summer (Table 1 and Histogram 1). The most active times of day were between the hours of 10:00 am and 4:00 pm with between 147 and 181 launches during these times (Table 2 and Histogram 2). The busiest days of the week were Saturday (22%, f=365) followed by Sunday (18.2%, f=302) and Friday (16.2%, f=268) (Histogram 3 and Table 3). Finally, the percentage of clips in which watercraft registration numbers were visible was 24.4% of the 1656 unique watercraft entries (Table 4). Registration visibility was impaired in many clips by timing problems with I-LIDS.

Origin and Use of Watercraft

Inspector sheets completed by volunteers at the boat landing were used to determine watercraft origin and use. As inspectors worked 16 hours per week, their data includes about 12.4% of the total watercraft launches, while 1,451 launches occurred when inspectors were not present and were categorized as “origin unknown” as this information is not conveyed through video captures. Analysis of the inspector sheets shows that 87 came from storage, 205 were local or transient, and 110 came from another lake or river (Tables 5 and 6). While patrons reported coming from lakes throughout Minnesota as well as other states, the most frequently mentioned were Leech and Big Pine, with 9 and 8 watercraft, respectively (Table 5). This finding is noteworthy in that Leech Lake is infested with Eurasian watermilfoil.

Time Since Last Launch

Current recommendations from the Department of Natural Resources (MNDNR) are to power-wash watercraft after leaving AIS infested lakes and preferably allowing the craft

to dry out over a period of five days to ensure eradication of any aquatic species remaining. Volunteer inspector sheets were utilized to determine if watercraft entering the lake had been in a water body within the last five days before entering 10-Mile. Of the 200 boats for which this information was available, either by inspector sheets or observation done by video reviewers, 117 had been dry for more than 5 days, while 83 had been used in the last 5 days or were recognized by inspectors as having been retrieved from 10 mile in that period (Table 7). Those that had been in a water body less than 5 days previous to launch at Ten Mile were further divided into categories dependent on whether the last water body is infested with AIS. Of the 108 watercraft for which this data was obtained by inspectors, 17 vessels had recently been in waters infested with AIS, while 9 came from lakes that could not be verified as to their status (out of state, etc.) and 82 were from origins not infested with AIS (Table 8).

Watercraft Potentially Carrying AIS

The identification of AIS on watercraft was determined through volunteer inspection sheets. Analysis of I-LIDS clips yielded no evidence of AIS and only a few accounts of bilge drainage due to the length and resolution of videos. The inspection sheets reported one entry or less of both aquatic vegetation or animals on watercraft as well as un-drained bilges, live wells, or bait containers. By “one entry or less”, the single video capture in question displayed a film on the watercraft that was suspected to be mud or biofilm, but a precise identification could not be determined and it is possible that the craft was simply covered in a large quantity of dust or mud from a source other than an aquatic bed. Many video clips showed questionable detail, with objects such as trailer wiring or tie-downs being mistaken for aquatic vegetation, but careful examination of those clips numerous times revealed them to be false alarms.

Level of AIS Awareness Among Boaters

Volunteer inspectors determined AIS awareness. Watercraft users were asked if they were aware of AIS. From this, it was to be determined about their awareness of individual laws including: 1) Boats and trailers must be free of aquatic weeds, animals and mud, 2) All drain plugs must be removed upon leaving a body of water, 3) Live wells must be drained and dry, and 4) Transportation of bait water is not permitted between lakes and rivers (Table 9). As the inspectors did not report responses to these individual laws, boater awareness must be determined through behavior. Once again, inspection sheets accounted for just 12.4% (f=206) of total launches. There were no responses that reported “no” to awareness of these laws or grades less than “B” on boat inspections, so it can be assumed that boaters are well aware of Minnesota AIS laws.

Recommendations

Many variables exist that are not easily captured by current inspector sheets, though only a few changes are needed to resolve issues. Asking more detail about watercraft origin would allow reliable cross-referencing of AIS status, while future study of video captures would also benefit from slight redesigns to the variables considered and length of the video clip, based again on what level of detail is required in analysis. Being able to

determine if a vessel is truly entering or leaving a lake is not as clear with the current 10 second sampling, and a large portion of the videos are clear enough to make a best guess but not a reliable distinction. One further suggestion is an examination of launch use by dock and lift services. Video clips showed frequent launches by these services, and they often entered and exited quite quickly, raising concern that they may not be properly checking trucks and watercrafts for AIS.

Appendix

Table 1 (Note: All percentages are valid when conducting a census)

WEEK

Week Ending		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5/26	91	5.5	5.5	5.5
	6/2	116	7.0	7.0	12.5
	6/9	112	6.8	6.8	19.3
	6/16	66	4.0	4.0	23.2
	6/23	62	3.7	3.7	27.0
	6/30	186	11.2	11.2	38.2
	7/7	240	14.5	14.5	52.7
	7/14	130	7.9	7.9	60.6
	7/21	132	8.0	8.0	68.5
	7/28	88	5.3	5.3	73.9
	8/4	99	6.0	6.0	79.8
	8/11	78	4.7	4.7	84.5
	8/18	67	4.0	4.0	88.6
	8/25	59	3.6	3.6	92.1
	9/1	60	3.6	3.6	95.8
	9/8	37	2.2	2.2	98.0
	9/15	33	2.0	2.0	100.0
	Total	1656	100.0	100.0	

Table 2

Hour

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6	22	1.3	1.3	1.3
	7	34	2.1	2.1	3.4
	8	53	3.2	3.2	6.6
	9	100	6.0	6.0	12.6
	10	147	8.9	8.9	21.5
	11	175	10.6	10.6	32.1
	12	156	9.4	9.4	41.5
	13	161	9.7	9.7	51.2
	14	179	10.8	10.8	62.0
	15	181	10.9	10.9	72.9
	16	176	10.6	10.6	83.6
	17	126	7.6	7.6	91.2
	18	90	5.4	5.4	96.6
	19	56	3.4	3.4	100.0
	Total	1656	100.0	100.0	

Table 3

Day of week

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SUNDAY	302	18.2	18.2	18.2
	MONDAY	201	12.1	12.1	30.4
	TUESDAY	195	11.8	11.8	42.1
	WEDNESDAY	153	9.2	9.2	51.4
	THURSDAY	172	10.4	10.4	61.8
	FRIDAY	268	16.2	16.2	78.0
	SATURDAY	365	22.0	22.0	100.0
	Total	1656	100.0	100.0	

Table 4

REG VIS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1252	75.6	75.6	75.6
	Yes	404	24.4	24.4	100.0
	Total	1656	100.0	100.0	

Table 5

ORIGIN DETAIL

Lake (County)		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lotus (Carver)	1	.9	.9	.9
	Birch (Cass)	2	1.8	1.8	2.7
	Long (Cass)	2	1.8	1.8	4.5
	Vermillion (Cass)	1	.9	.9	5.5
	Winnibigoshish (Cass)	2	1.8	1.8	7.3
	Woman (Cass)	2	1.8	1.8	9.1
	Leech (Cass)	9	8.2	8.2	17.3
	Widow (Cass)	1	.9	.9	18.2
	Baby (Cass)	1	.9	.9	19.1
	Crooked (Cass)	1	.9	.9	20.0

	Pleasant (Cass)	4	3.6	3.6	23.6
	Pine Mountain (Cass)	1	.9	.9	24.5
	Ten Mile (Cass)	60	54.5	54.5	79.1
	Whitefish (Crow Wing)	1	.9	.9	80.0
	Crow Wing (Crow Wing)	3	2.7	2.7	82.7
	Pelican (Crow Wing)	1	.9	.9	83.6
	North Long (Crow Wing)	1	.9	.9	84.5
	Nelson (Beltrami)	1	.9	.9	85.5
	Medicine (Beltrami)	1	.9	.9	86.4
	Big Bass (Beltrami)	1	.9	.9	87.3
	Minnie-Belle (Meeker)	1	.9	.9	88.2
	Mille Lacs (Mille Lacs)	3	2.7	2.7	90.9
	Big Pine (Otter Tail)	8	7.3	7.3	98.2
	Otter Tail (Otter Tail)	1	.9	.9	99.1
	South Turtle (Otter Tail)	1	.9	.9	100.0
	Total	110	100.0	100.0	

Table 6

Origin of craft

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unknown	1451	87.7	87.7	87.7
	Local	132	8.0	8.0	95.6
	Transient	73	4.4	4.4	100.0
	Total	1656	100.0	100.0	

Table 7

Time since last in water

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unknown	1456	87.9	87.9	87.9
	More than 5 days	117	7.1	7.1	95.0
	Less than 5 days	83	5.0	5.0	100.0
	Total	1656	100.0	100.0	

Table 8

AIS AT ORIGIN

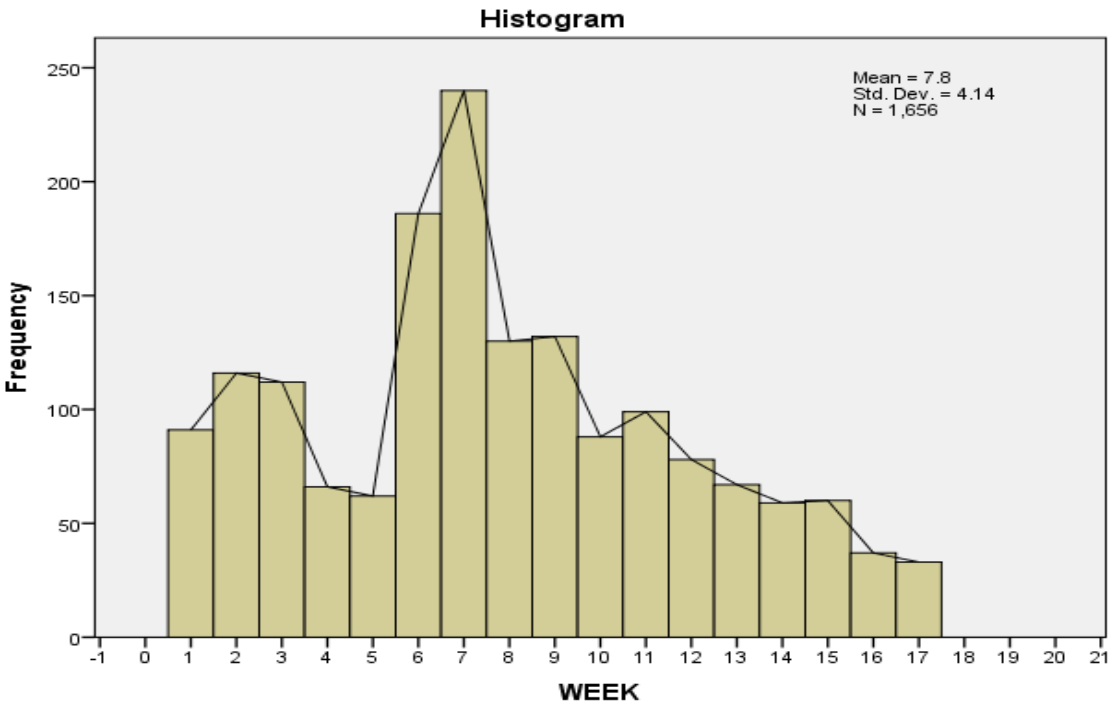
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	82	75.9	75.9	75.9
	U	9	8.3	8.3	84.3
	Yes	17	15.7	15.7	100.0
	Total	108	100.0	100.0	

Table 9

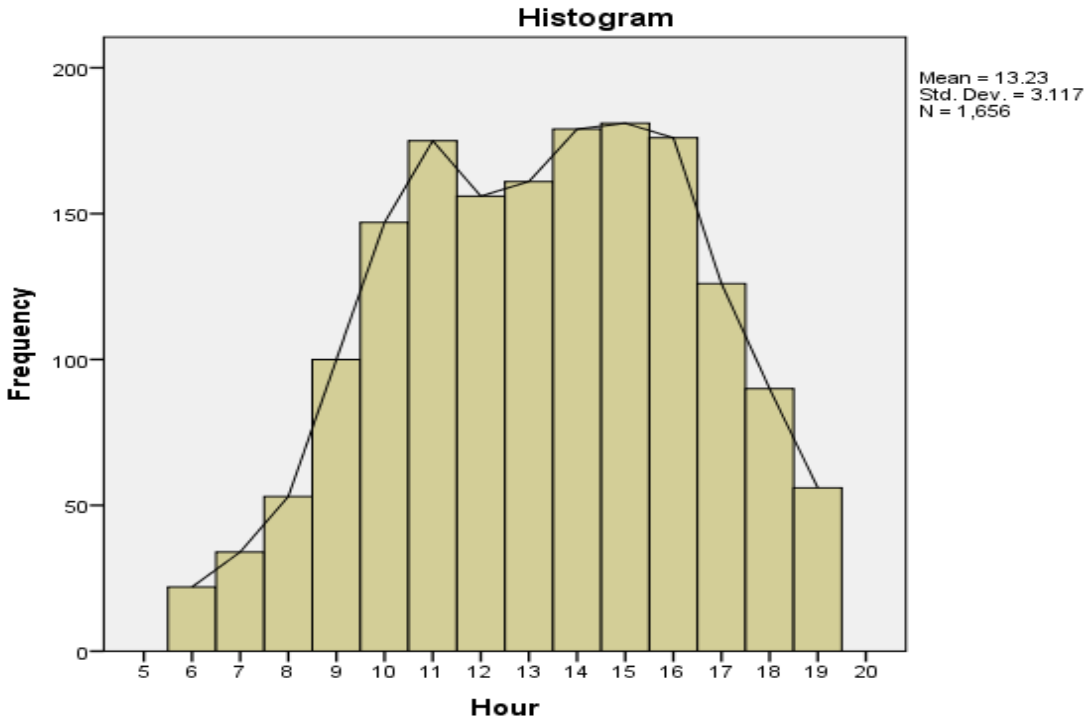
Boater Aware of Laws

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unknown	1450	87.3	87.3	87.3
	Yes	206	12.4	12.4	100.0
	Total	1656	100.0	100.0	

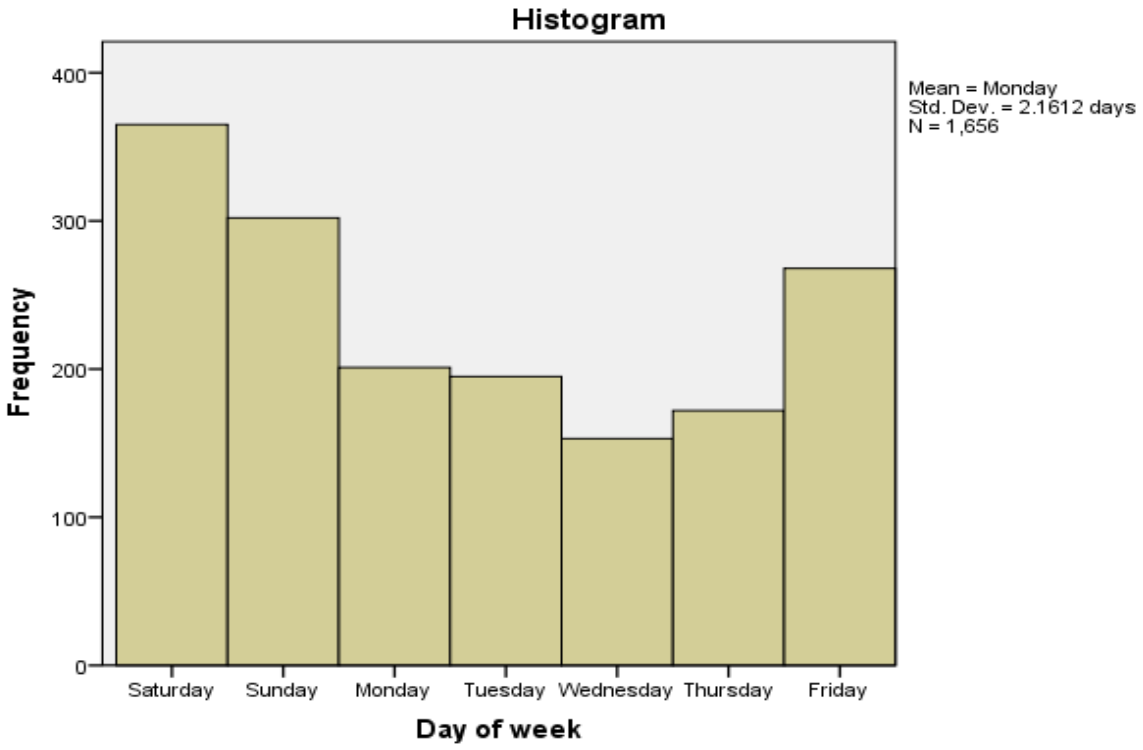
Histogram 1: Launches by Week



Histogram 2: Launches by Hour



Histogram 3: Launches by Day of Week


Histogram
Mean = Monday
Std. Dev. = 2.1612 days
N = 1,656
Frequency
400
300
200
100
0
Saturday
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Day of week