

MARSEILLE
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**Committee G Environment –
Case studies involving planning, construction and operation of dams demonstrating environmental and social benefits**

Lake Sturgeon Use of a Fish Ladder in North Central Québec, Canada

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Hydro-Québec**



Outline

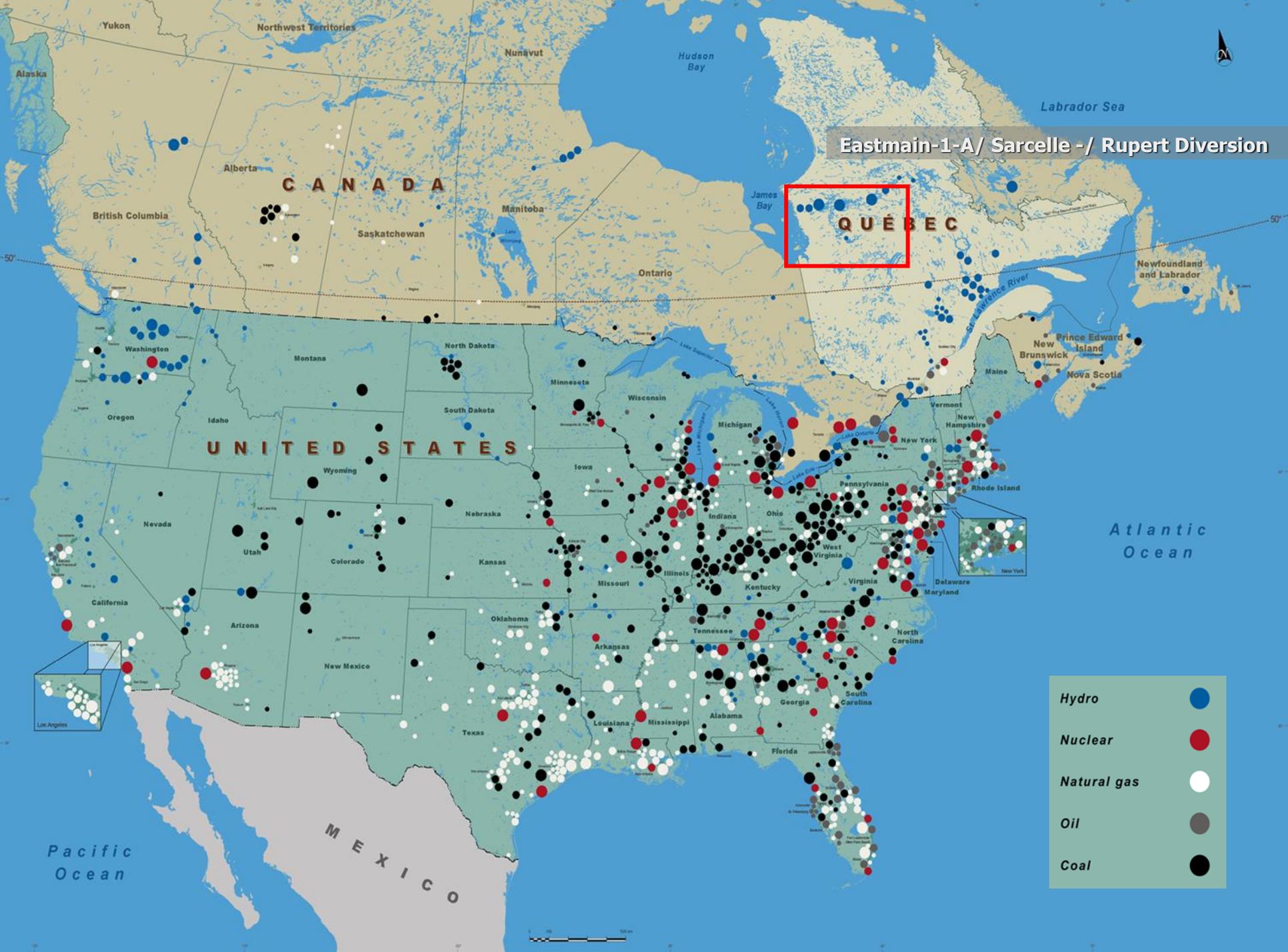
Project description

Fish passage Monitoring program

Results

Issues related to monitoring lake sturgeon





Eastmain-1-A/ Sarcelle -/ Rupert Diversion



- Hydro ●
- Nuclear ●
- Natural gas ●
- Oil ●
- Coal ●

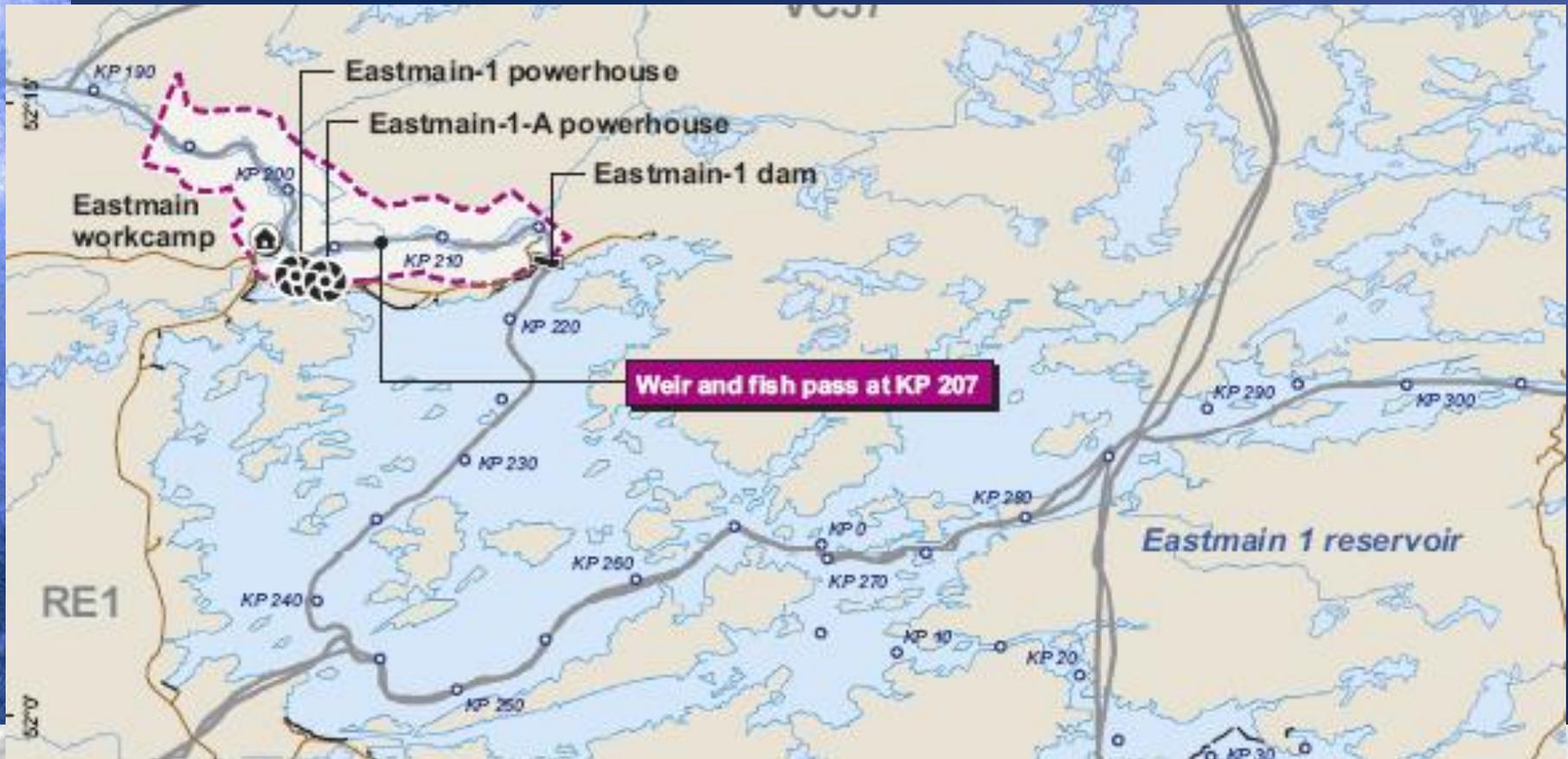
Eastmain-1-A and Sarcelle Powerhouses and Rupert Diversion

Project Location

Sturgeons came from the Opinaca diversion



Geographical Location of the Fish Pass



PK 207 Fish pass Follow up in the Eastmain River



Monitoring objectives

- To assess the use of the fish pass at KP 207 of the Eastmain River
- To monitor movements in the downstream portion of the fish pass under operating conditions

Fish Pass characteristics

- Pool and weir type of fish pass
- 17 basins
- 150 m long and 15 m a wide
- Each step has a height of 0,15 m
- Maximum water velocity is 1m/sec



Fish passage tracking

- Approximately 2000 fish of 10 species were tagged using passive integrated transponder (PIT) tags
- 314 Lake Sturgeon were tagged
- 2007-2009 and 2012



PHOTOS 5 et 6 — Pose et vérification d'un PIT tag lors du marquage (16 juin 2012)



Lenght-class distribution of sturgeon tagged

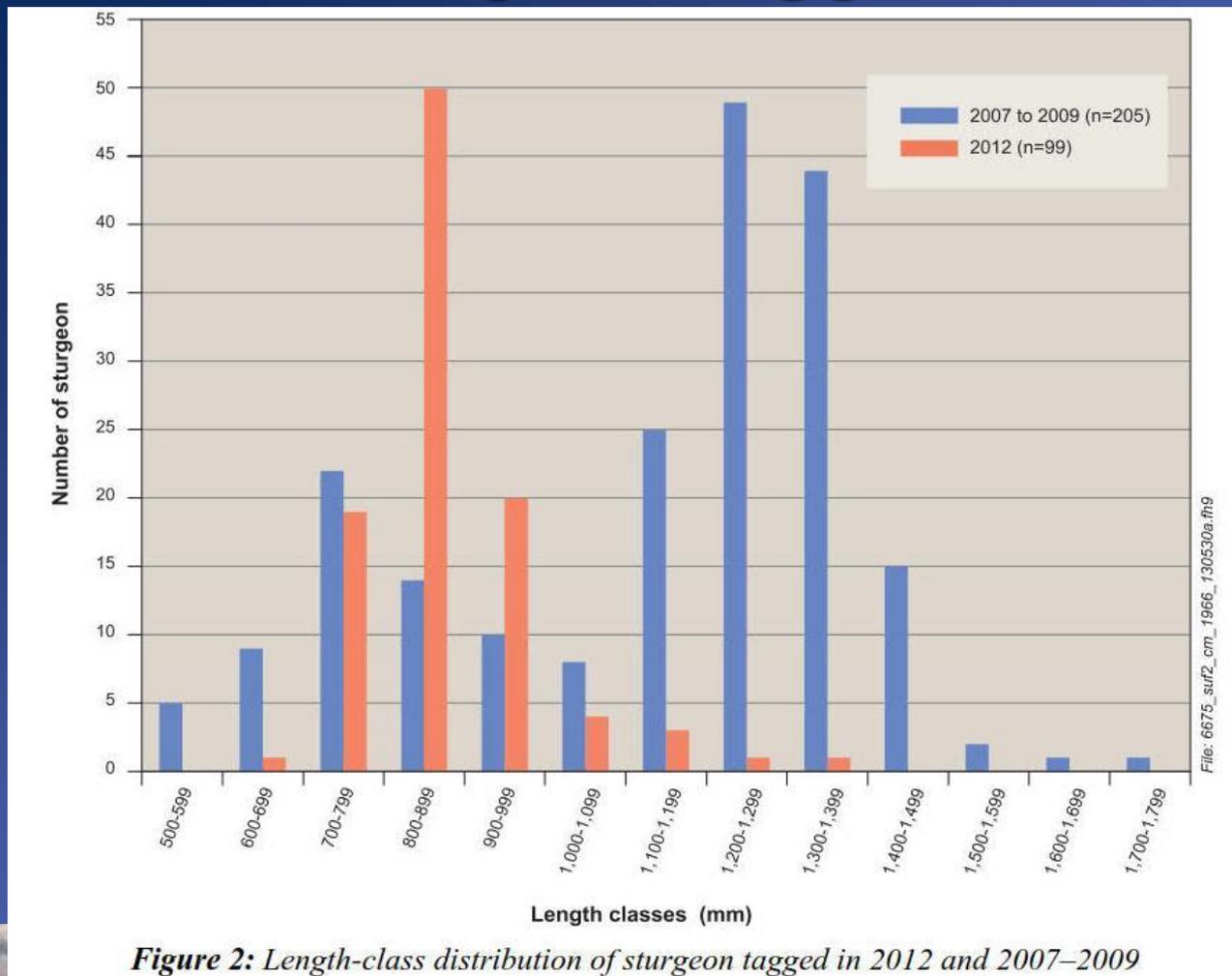
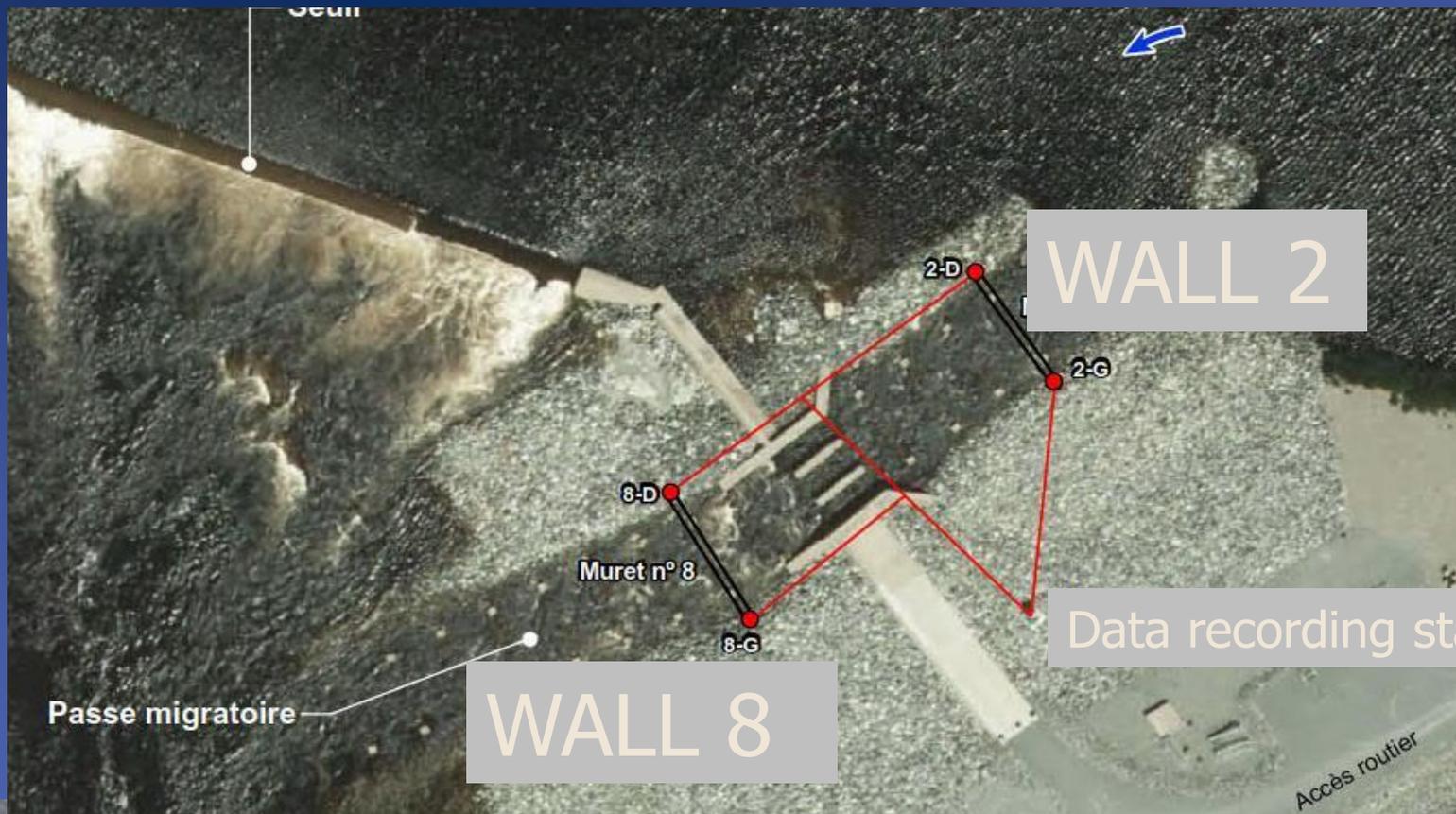


TABLE 1 - Overview of PIT-tagging results, 2007–2012

Species code*	Total number of individuals tagged					Total (2007–2012)
	2007	2008	2009	Subtotal (2007–2009)	2012	
ACFU	47	126	41	214	100	314
CACA	734	9		743	0	743
CACO	119	2		121	0	121
COAR		3		3	0	3
COCL		148		148	0	148
ESLU	30	146		176	114	290
LOLO		1		1	0	1
SANA		1		1	0	1
SAVI	134	94		228	101	329
SECO		1		1	0	1
Total	1,064	531	41	1,636	315	1,951

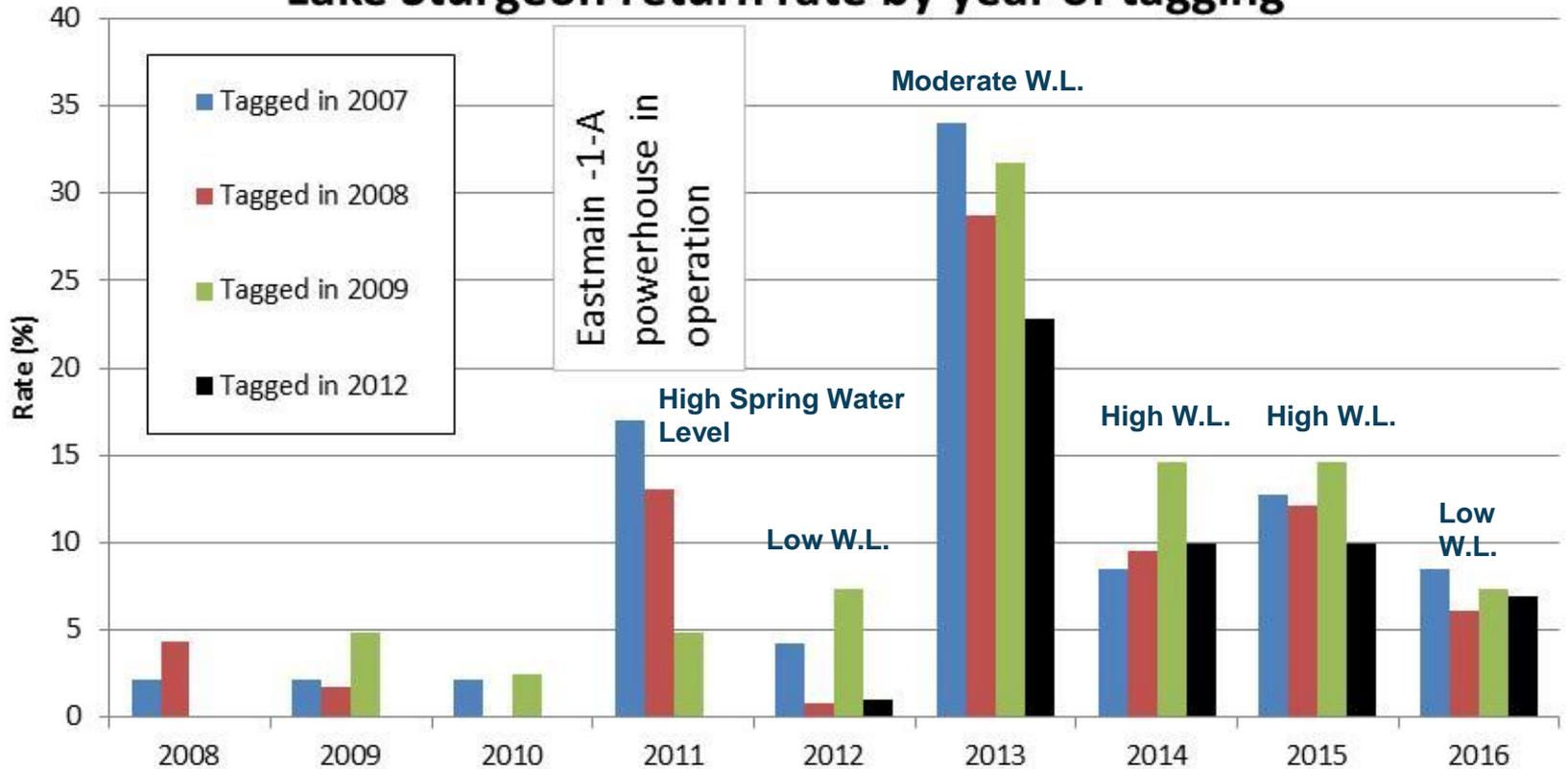
Antenna position

Wall 8 (middle); Wall 2 (upstream)

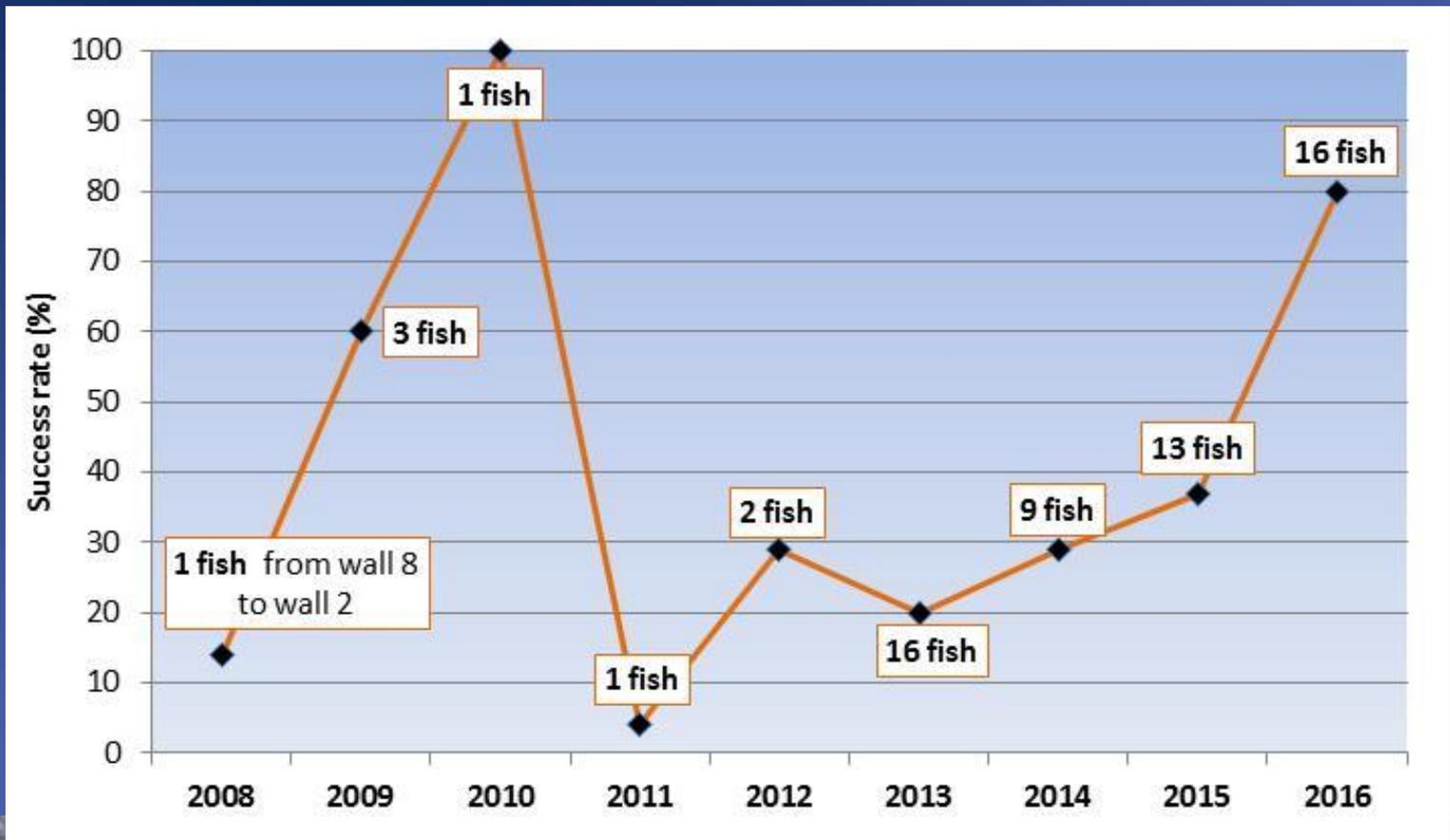


Return rate

Lake Sturgeon return rate by year of tagging



Upstream migration success from 2008 to 2016



Conclusion

The results of the monitoring program suggest that the fish pass provides adequate conditions for upstream migration of lake sturgeon.

Earlier results indicated that lake sturgeon seemed to be proportionately less attracted to the fish pass.

Length of the monitoring program covering at least one reproduction cycle was necessary



Issues related to monitoring lake sturgeon

Sturgeon resilience

Long reproductive cycles

Site fidelity

Lake sturgeons are gregarious

Biologist patience