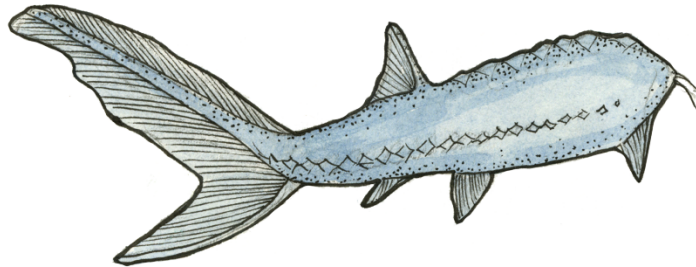


**Table S1.** Over the six-year (2016-2022) study, we experienced some receiver loss, and were able to retrieve and download subsets of receivers in different years. This table summarizes the receivers per section, total river length with receivers, and mean distance between receivers for different periods across the study.

<b>Time period</b>	<b>Receivers per section</b>	<b>River length with receivers</b>	<b>Distance between receivers</b>
June 2016 to June 2018	Most upstream – 2 Above winter road – 3 Below winter road – 1 Most downstream – 1	39.35 km between most upstream and most downstream receiver	Mean = 6.56 km between receivers Range = 4.11 – 9.98 km
June 2018 to October 2018	Most upstream – 2 Above winter road – 3 Below winter road – 1 Most downstream – 2	45.04 km between most upstream and most downstream receiver	Mean = 6.43 km between receivers Range = 4.29 – 9.58 km
October 2018 to May 2019	Most upstream – 3 Above winter road – 3 Below winter road – 1 Most downstream – 1	51.03 km between most upstream and most downstream receiver	Mean = 7.35 km between receivers Range = 4.68 – 9.58 km
May 2019 to October 2020	Most upstream – 2 Above winter road – 1 Below winter road – 1 Most downstream – 1	38.93 km between most upstream and most downstream receiver	Mean = 9.73 km between receivers Range = 6.67 – 15.88 km
October 2020 to May 2021	Most upstream – 0 Above winter road – 0 Below winter road – 0 Most downstream – 1	NA	NA
May/June 2021 to May 2022	Most upstream – 2 Above winter road – 3 Below winter road – 1 Most downstream – 0	41.45 km between most upstream and most downstream receiver	Mean = 8.29 km between receivers Range = 4.29 – 13.58 km

**Table S2.** Output table of the four season model for seasonal movement rate (m/day) of namew (n = 20) during the six-year study (between June 2016 and May 2022) in the North French River as a function of season (spring, summer, fall, and winter), including fish ID as a random effect, and a covariance structure term.



### Seasonal Movement Rate (m/day)

	<i>numDF</i>	<i>F-value</i>	<i>P-value</i>
<b>Intercept</b>	1	30.13	< 0.0001
<b>Season</b>	3	10.91	< 0.0001

**Table S3.** Post-hoc pairwise comparison table of the four season model for seasonal movement rate (m/day) of namew (n = 20) during the six-year study (between June 2016 and May 2022) in the North French River as a function of season (spring, summer, fall, and winter), including fish ID as a random effect, and a covariance structure term.

Season comparison	coefficient estimate	SE	df	t-ratio	p-value
(Break-up) - Fall	-70.3	49.2	180	-1.4	0.4831
(Break-up) - Spring	-233.3	48.7	180	-4.8	<0.0001
(Break-up) - Summer	-228.3	49.7	180	-4.6	<0.0001
Fall - Spring	-163.0	45.6	180	-3.6	0.0025
Fall - Summer	-158.0	48.0	180	-3.3	0.0066
Spring - Summer	5.0	44.1	180	0.1	0.9995

**Table S4.** Post-hoc pairwise comparison tables of the acceleration ( $m/s^2$ ) model for tagged namew in the North French River between June 2016 and June 2017 ( $n = 4$ ), as well as between June 2018 and June 2019 ( $n = 5$ ). The acceleration ( $m/s^2$ ) data were randomly thinned, and the model included predictor variables of season (break-up, spring, summer, fall, freeze-up and winter) and time-of-day (dawn, morning, afternoon, dusk, and night) and we included an interaction effect, fish ID as a random effect, and a covariance structure term. The model revealed that the interaction effect was significant, thus examining post-hoc pairwise differences of the interaction effect was more appropriate than examining post-hoc pairwise differences among seasons and diurnal periods independently.

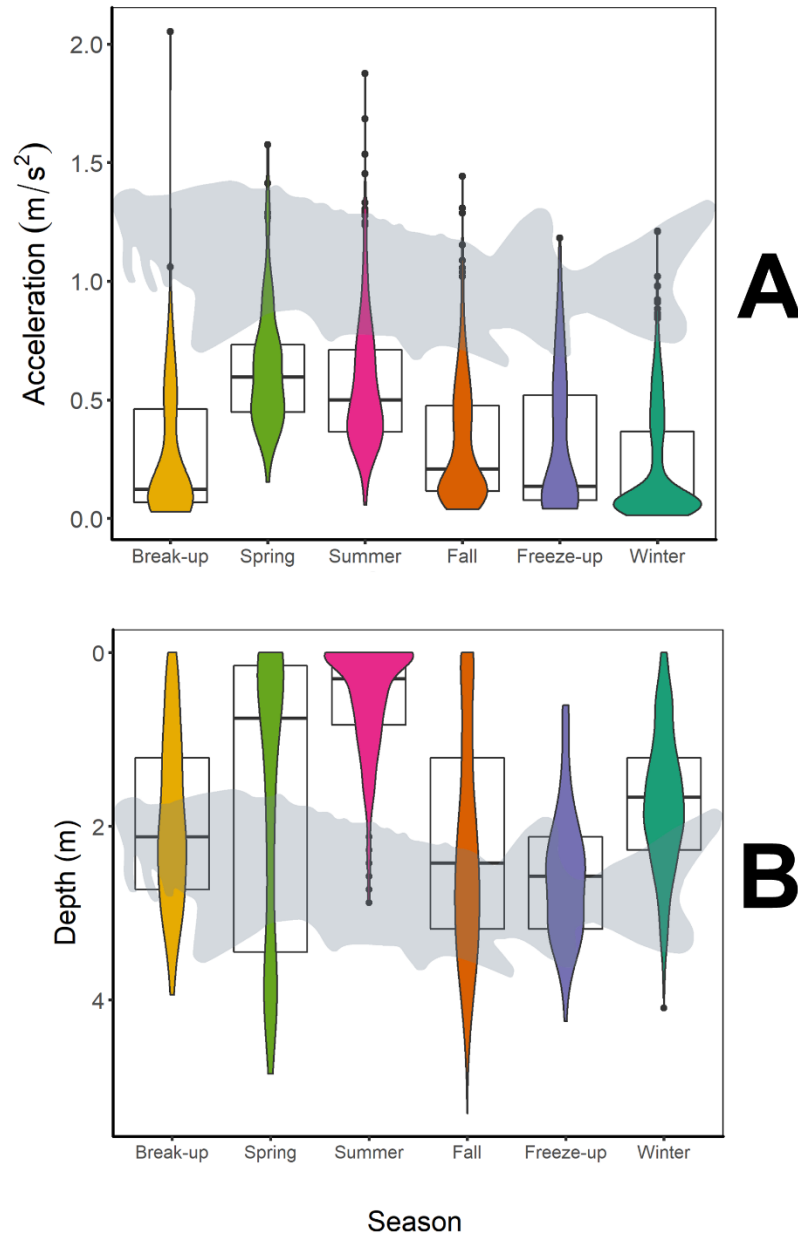
Break-up					
	coefficient estimate	SE	df	t-ratio	p-value
Dawn - Morning	0.18	0.08	1992	2.24	0.1667
Dawn - Afternoon	0.15	0.08	1992	1.78	0.3864
Dawn - Dusk	-0.15	0.17	1992	-0.84	0.9167
Dawn - Night	-0.07	0.08	1992	-0.94	0.8805
Morning - Afternoon	-0.03	0.06	1992	-0.50	0.9874
Morning - Dusk	-0.33	0.17	1992	-1.96	0.2871
Morning - Night	-0.25	0.06	1992	-4.56	0.0001
Afternoon - Dusk	-0.30	0.17	1992	-1.76	0.3986
Afternoon - Night	-0.22	0.06	1992	-3.86	0.0011
Dusk - Night	0.07	0.16	1992	0.46	0.9911
Fall					
	coefficient estimate	SE	df	t-ratio	p-value
Dawn - Morning	0.12	0.04	1992	2.98	0.0245
Dawn - Afternoon	0.15	0.04	1992	3.83	0.0012
Dawn - Dusk	0.13	0.05	1992	2.85	0.0362
Dawn - Night	0.01	0.03	1992	0.31	0.998
Morning - Afternoon	0.03	0.04	1992	0.70	0.9564
Morning - Dusk	0.01	0.05	1992	0.17	0.9998
Morning - Night	-0.11	0.03	1992	-3.35	0.0074
Afternoon - Dusk	-0.02	0.04	1992	-0.44	0.9922
Afternoon - Night	-0.14	0.03	1992	-4.49	0.0001
Dusk - Night	-0.12	0.04	1992	-3.03	0.0211
Freeze-up					
	coefficient estimate	SE	df	t-ratio	p-value
Dawn - Morning	0.25	0.11	1992	2.23	0.1707
Dawn - Afternoon	0.13	0.11	1992	1.26	0.7187
Dawn - Dusk	0.23	0.15	1992	1.48	0.5735
Dawn - Night	-0.06	0.09	1992	-0.61	0.974
Morning - Afternoon	-0.12	0.10	1992	-1.18	0.7657
Morning - Dusk	-0.02	0.15	1992	-0.16	0.9999
Morning - Night	-0.31	0.08	1992	-3.81	0.0013
Afternoon - Dusk	0.09	0.15	1992	0.64	0.9686
Afternoon - Night	-0.19	0.07	1992	-2.51	0.0885
Dusk - Night	-0.28	0.13	1992	-2.11	0.2175

Spring					
	coefficient estimate	SE	df	t-ratio	p-value
Dawn - Morning	0.05	0.12	1992	0.38	0.9957
Dawn - Afternoon	-0.02	0.12	1992	-0.18	0.9998
Dawn - Dusk	0.22	0.17	1992	1.30	0.6891
Dawn - Night	-0.08	0.12	1992	-0.69	0.9594
Morning - Afternoon	-0.07	0.06	1992	-1.04	0.8357
Morning - Dusk	0.17	0.14	1992	1.26	0.7187
Morning - Night	-0.13	0.06	1992	-2.08	0.2283
Afternoon - Dusk	0.24	0.14	1992	1.73	0.4141
Afternoon - Night	-0.06	0.06	1992	-0.99	0.859
Dusk - Night	-0.30	0.14	1992	-2.22	0.1719
Summer					
	coefficient estimate	SE	df	t-ratio	p-value
Dawn - Morning	0.15	0.05	1992	3.23	0.0109
Dawn - Afternoon	0.16	0.05	1992	3.34	0.0076
Dawn - Dusk	-0.06	0.06	1992	-0.95	0.8763
Dawn - Night	0.07	0.05	1992	1.42	0.6146
Morning - Afternoon	0.01	0.03	1992	0.25	0.9992
Morning - Dusk	-0.21	0.05	1992	-4.12	0.0004
Morning - Night	-0.08	0.03	1992	-2.45	0.1021
Afternoon - Dusk	-0.22	0.05	1992	-4.15	0.0003
Afternoon - Night	-0.09	0.03	1992	-2.58	0.0736
Dusk - Night	0.13	0.05	1992	2.39	0.1193
Winter					
	coefficient estimate	SE	df	t-ratio	p-value
Dawn - Morning	0.06	0.03	1992	2.11	0.2183
Dawn - Afternoon	0.07	0.03	1992	2.63	0.0663
Dawn - Dusk	0.07	0.03	1992	2.23	0.1688
Dawn - Night	-0.04	0.02	1992	-1.85	0.3438
Morning - Afternoon	0.02	0.03	1992	0.60	0.9759
Morning - Dusk	0.01	0.03	1992	0.38	0.9958
Morning - Night	-0.10	0.02	1992	-5.02	<0.0001
Afternoon - Dusk	0.00	0.03	1992	-0.15	0.9999
Afternoon - Night	-0.12	0.02	1992	-5.68	<0.0001
Dusk - Night	-0.11	0.02	1992	-4.60	<0.0001

**Table S5.** Post-hoc pairwise comparison tables of depth (m) of tagged namew in the North French River between June 2016 and June 2017 (n = 4), as well as between June 2018 and June 2019 (n = 7). The depth (m) data were randomly thinned, and the model included predictor variables of season (break-up, spring, summer, fall, freeze-up and winter) and time-of-day (dawn, morning, afternoon, dusk, and night) and we included an interaction effect, fish ID as a random effect, and a covariance structure term. The model revealed that the interaction effect was significant, thus examining post-hoc pairwise differences of the interaction effect was more appropriate than examining post-hoc pairwise differences among seasons and diurnal periods independently.

Winter					
	coefficient estimate	SE	df	t-ratio	p-value
Afternoon - Dawn	0.19	0.06	2491	3.27	0.0096
Afternoon - Dusk	0.08	0.06	2491	1.361	0.6527
Afternoon - Morning	0.06	0.05	2491	1.174	0.7666
Afternoon - Night	0.25	0.04	2491	5.652	<.0001
Dawn - Dusk	-0.12	0.06	2491	-1.898	0.3183
Dawn - Morning	-0.13	0.06	2491	-2.246	0.1634
Dawn - Night	0.05	0.05	2491	1.118	0.7973
Dusk - Morning	-0.01	0.06	2491	-0.256	0.9991
Dusk - Night	0.17	0.05	2491	3.589	0.0031
Morning - Night	0.19	0.04	2491	4.35	0.0001
Break-up					
	coefficient estimate	SE	df	t-ratio	p-value
Afternoon - Dawn	0.23	0.18	2491	1.236	0.7301
Afternoon - Dusk	0.12	0.20	2491	0.605	0.9744
Afternoon - Morning	-0.27	0.13	2491	-2.024	0.2548
Afternoon - Night	0.55	0.13	2491	4.194	0.0003
Dawn - Dusk	-0.11	0.24	2491	-0.446	0.9918
Dawn - Morning	-0.50	0.17	2491	-2.884	0.0323
Dawn - Night	0.32	0.16	2491	1.973	0.2798
Dusk - Morning	-0.39	0.21	2491	-1.881	0.3276
Dusk - Night	0.43	0.20	2491	2.148	0.2003
Morning - Night	0.82	0.12	2491	6.655	<.0001
Spring					
	coefficient estimate	SE	df	t-ratio	p-value
Afternoon - Dawn	0.25	0.19	2491	1.302	0.6902
Afternoon - Dusk	0.99	0.33	2491	3.029	0.0209
Afternoon - Morning	0.05	0.13	2491	0.363	0.9963
Afternoon - Night	0.19	0.13	2491	1.386	0.637
Dawn - Dusk	0.74	0.37	2491	2.003	0.2646
Dawn - Morning	-0.20	0.20	2491	-1.023	0.8446
Dawn - Night	-0.06	0.20	2491	-0.316	0.9978
Dusk - Morning	-0.94	0.34	2491	-2.748	0.0476
Dusk - Night	-0.81	0.33	2491	-2.427	0.1086
Morning - Night	0.14	0.15	2491	0.937	0.8825

Summer					
	coefficient estimate	SE	df	t-ratio	p-value
Afternoon - Dawn	0.17	0.10	2491	1.665	0.4562
Afternoon - Dusk	-0.24	0.14	2491	-1.724	0.419
Afternoon - Morning	-0.16	0.07	2491	-2.257	0.1593
Afternoon - Night	0.20	0.07	2491	2.943	0.0272
Dawn - Dusk	-0.41	0.16	2491	-2.629	0.0654
Dawn - Morning	-0.33	0.10	2491	-3.258	0.01
Dawn - Night	0.03	0.10	2491	0.308	0.998
Dusk - Morning	0.08	0.14	2491	0.573	0.979
Dusk - Night	0.44	0.14	2491	3.259	0.01
Morning - Night	0.36	0.07	2491	5.197	<0.0001
Fall					
	coefficient estimate	SE	df	t-ratio	p-value
Afternoon - Dawn	0.71	0.10	2491	7.329	<0.0001
Afternoon - Dusk	0.22	0.09	2491	2.407	0.1136
Afternoon - Morning	0.15	0.08	2491	1.815	0.3651
Afternoon - Night	0.87	0.07	2491	12.919	<0.0001
Dawn - Dusk	-0.49	0.11	2491	-4.514	0.0001
Dawn - Morning	-0.56	0.10	2491	-5.617	<0.0001
Dawn - Night	0.15	0.09	2491	1.773	0.3898
Dusk - Morning	-0.07	0.10	2491	-0.77	0.9391
Dusk - Night	0.64	0.08	2491	7.902	<0.0001
Morning - Night	0.72	0.07	2491	10.129	<0.0001
Freeze-up					
	coefficient estimate	SE	df	t-ratio	p-value
Afternoon - Dawn	0.59	0.24	2491	2.436	0.1062
Afternoon - Dusk	0.56	0.26	2491	2.151	0.1989
Afternoon - Morning	0.16	0.27	2491	0.585	0.9773
Afternoon - Night	0.63	0.21	2491	2.993	0.0234
Dawn - Dusk	-0.03	0.23	2491	-0.14	0.9999
Dawn - Morning	-0.43	0.23	2491	-1.854	0.3426
Dawn - Night	0.04	0.17	2491	0.233	0.9993
Dusk - Morning	-0.40	0.25	2491	-1.617	0.4867
Dusk - Night	0.07	0.18	2491	0.395	0.9949
Morning - Night	0.47	0.19	2491	2.492	0.0928



**Figure S1.** (A) Acceleration ( $\text{m/s}^2$ ) and (B) depth (m) of tagged namew in the North French River during six seasons (break-up, spring, summer, fall, freeze-up, winter) between June 2016 and June 2017 ( $n = 4$  for both acceleration and depth), and between June 2018 and June 2019 ( $n = 5$  for acceleration;  $n = 7$  for depth). Width of the violin plot represents the number of observations at that value. Dots represent outliers. The box plots within the violin plots represent the quartiles and 95% confidence intervals.