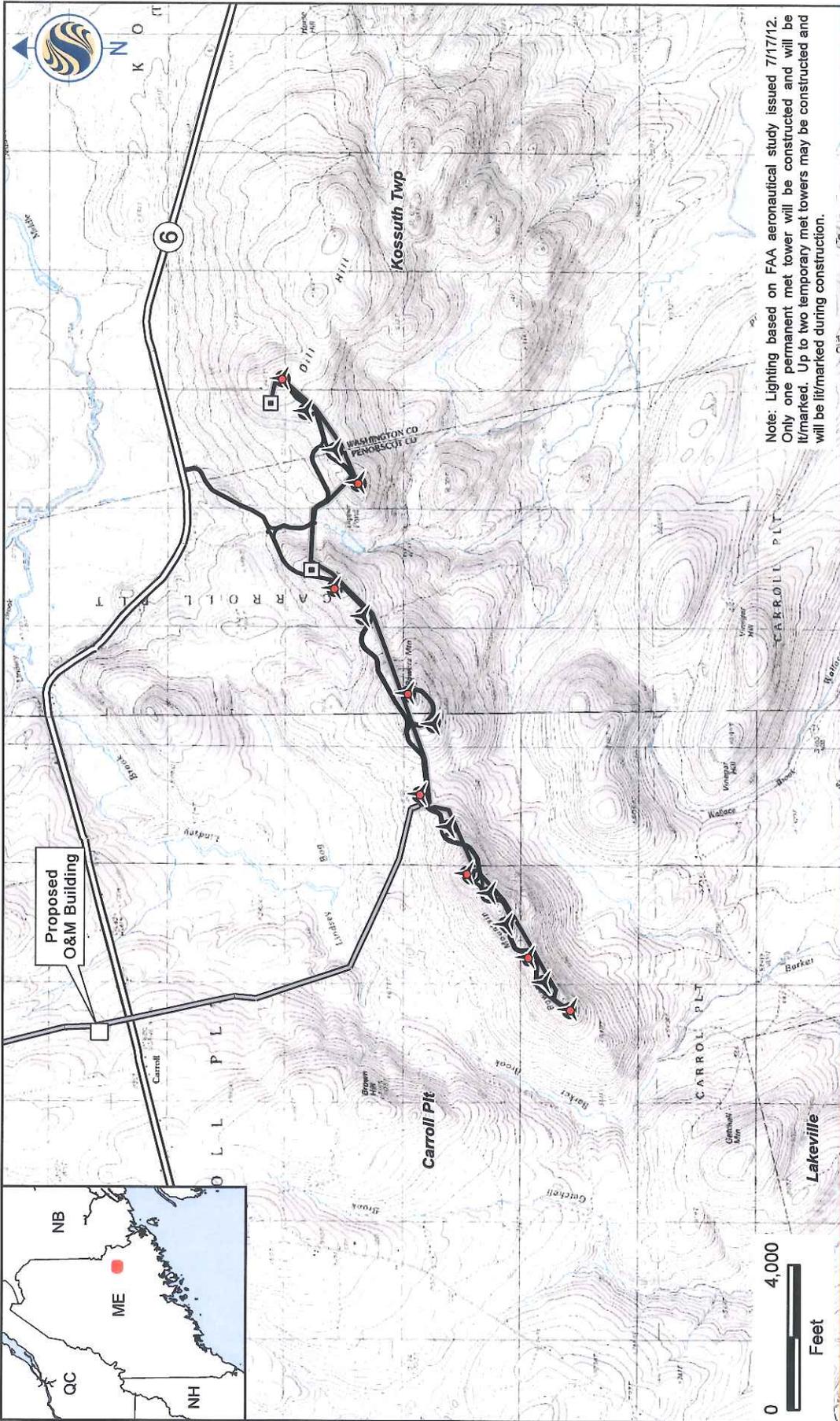


**Exhibit 30D: Lighting Plan**



Note: Lighting based on FAA aeronautical study issued 7/17/12. Only one permanent met tower will be constructed and will be lit/markd. Up to two temporary met towers may be constructed and will be lit/markd during construction.

195600522

**Stantec Consulting Services Inc. Legend**  
 30 Park Drive  
 Topsham, ME USA  
 04086  
 Phone (207) 729-1199  
 Fax: (207) 729-2715  
 www.stantec.com



**Client/Project**  
 Champlain Wind, LLC  
 Bowers Mountain Wind Project  
 Carroll Pkt. and Kossuth Twp., Maine

**Figure No.**  
 1

**Title**  
 Lighting Map

9/24/2012

- Proposed Civil Design
- Proposed Turbine
- Simultaneously Flashing Red Lights
- Proposed Permanent MET Tower
- Proposed Mountain Top Collector
- Proposed Express Collector Corridor
- State Route 6

**FIRST WIND**  
**Bower's (B) Mountain Project**  
**12-N-0532.ME.001**  
**Springfield, ME**

Bowers Lighting Plan							
Turbine ID	Latitude (NAD 83)	Longitude (NAD 83)		Structure Height AGL	Total Height (AMSL)	Recommended Marking/ Lighting	FAA Aeronautical Study #
	[dd mm ss.ss]	[dd mm ss.ss]	(ft)	[ft]	[ft]		
1	45 22 53.69	68 01 53.59	1102	460	1562	SFRL	2012-WTE-2750
2	45 23 00.73	68 01 42.98	1083	460	1543	NONE	2012-WTE-2751
3	45 23 05.13	68 01 33.10	1074	460	1534	SFRL	2012-WTE-2752
4	45 23 11.03	68 01 20.30	1148	460	1608	NONE	2012-WTE-2753
5	45 23 15.51	68 01 08.31	1138	460	1598	NONE	2012-WTE-2754
6	45 23 21.66	68 01 00.48	1148	460	1608	SFRL	2012-WTE-2755
7	45 23 26.66	68 00 42.40	916	460	1376	NONE	2012-WTE-2756
8	45 23 34.48	68 00 29.50	829	460	1289	SFRL	2012-WTE-2757
9	45 23 30.46	68 00 02.40	917	460	1377	NONE	2012-WTE-2758
10	45 23 37.54	67 59 50.42	1018	460	1478	SFRL	2012-WTE-2759
11	45 23 49.68	67 59 20.35	773	460	1233	NONE	2012-WTE-2760
12	45 23 57.47	67 59 09.29	806	460	1266	SFRL	2012-WTE-2761
13	45 23 50.59	67 58 28.59	903	460	1363	SFRL	2012-WTE-2762
14	45 23 56.96	67 58 15.83	847	460	1307	NONE	2012-WTE-2763
15	45 24 04.56	67 58 00.59	878	460	1338	NONE	2012-WTE-2764
16	45 24 10.93	67 57 47.83	930	460	1390	SFRL	2012-WTE-2765

Note: All Turbine Structures are white.

SFRL - Simultaneously Flashing Red Lights / White Paint. NONE - Unlit/White Paint only.



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2750-OE  
 Prior Study No.  
 2010-WTE-12542-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T1 - 12-N-0532.ME.001
Location:	Springfield, ME
Latitude:	45-22-53.69N NAD 83
Longitude:	68-01-53.59W
Heights:	1102 feet site elevation (SE)
	460 feet above ground level (AGL)
	1562 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2750-OE.

**Signature Control No: 163968681-168977598**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2751-OE  
 Prior Study No.  
 2010-WTE-12543-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T2
Location:	Springfield, ME
Latitude:	45-23-00.73N NAD 83
Longitude:	68-01-42.98W
Heights:	1083 feet site elevation (SE) 460 feet above ground level (AGL) 1543 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint only - Chapters 12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

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OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

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If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2751-OE.

**Signature Control No: 163968683-168977889**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2752-OE  
 Prior Study No.  
 2010-WTE-12544-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T3
Location:	Springfield, ME
Latitude:	45-23-05.13N NAD 83
Longitude:	68-01-33.10W
Heights:	1074 feet site elevation (SE)
	460 feet above ground level (AGL)
	1534 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

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This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2752-OE.

**Signature Control No: 163968684-168977603**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2753-OE  
 Prior Study No.  
 2010-WTE-12545-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T4
Location:	Springfield, ME
Latitude:	45-23-11.03N NAD 83
Longitude:	68-01-20.30W
Heights:	1148 feet site elevation (SE) 460 feet above ground level (AGL) 1608 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint only - Chapters 12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.

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If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2753-OE.

**Signature Control No: 163968685-168977891**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2754-OE  
 Prior Study No.  
 2010-WTE-12546-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T5
Location:	Springfield, ME
Latitude:	45-23-15.51N NAD 83
Longitude:	68-01-08.31W
Heights:	1138 feet site elevation (SE) 460 feet above ground level (AGL) 1598 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint only - Chapters 12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

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This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

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If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2754-OE.

**Signature Control No: 163968686-168977885**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2755-OE  
 Prior Study No.  
 2010-WTE-12547-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T6
Location:	Springfield, ME
Latitude:	45-23-21.66N NAD 83
Longitude:	68-01-00.48W
Heights:	1148 feet site elevation (SE) 460 feet above ground level (AGL) 1608 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

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This determination expires on 01/17/2014 unless:

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If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2755-OE.

**Signature Control No: 163968687-168977601**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2756-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T7
Location:	Springfield, ME
Latitude:	45-23-26.66N NAD 83
Longitude:	68-00-42.40W
Heights:	916 feet site elevation (SE)
	460 feet above ground level (AGL)
	1376 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint only - Chapters 12&13(Turbines).

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  X   Within 5 days after the construction reaches its greatest height (7460-2, Part II)

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NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION

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If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2756-OE.

**Signature Control No: 163968688-168977887**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2757-OE  
 Prior Study No.  
 2010-WTE-12549-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T8
Location:	Springfield, ME
Latitude:	45-23-34.48N NAD 83
Longitude:	68-00-29.50W
Heights:	829 feet site elevation (SE) 460 feet above ground level (AGL) 1289 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2757-OE.

**Signature Control No: 163968689-168977604**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2758-OE  
 Prior Study No.  
 2010-WTE-12550-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T9
Location:	Springfield, ME
Latitude:	45-23-30.46N NAD 83
Longitude:	68-00-02.40W
Heights:	917 feet site elevation (SE) 460 feet above ground level (AGL) 1377 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint only - Chapters 12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

**NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION**

OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2758-OE.

**Signature Control No: 163968690-168977890**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2759-OE  
 Prior Study No.  
 2010-WTE-12551-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T10
Location:	Springfield, ME
Latitude:	45-23-37.54N NAD 83
Longitude:	67-59-50.42W
Heights:	1018 feet site elevation (SE)
	460 feet above ground level (AGL)
	1478 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2759-OE.

**Signature Control No: 163968691-168977605**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2760-OE  
 Prior Study No.  
 2010-WTE-12552-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T11
Location:	Springfield, ME
Latitude:	45-23-49.68N NAD 83
Longitude:	67-59-20.35W
Heights:	773 feet site elevation (SE) 460 feet above ground level (AGL) 1233 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint only - Chapters 12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION

OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2760-OE.

**Signature Control No: 163968693-168977892**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2761-OE  
 Prior Study No.  
 2010-WTE-12553-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T12
Location:	Springfield, ME
Latitude:	45-23-57.47N NAD 83
Longitude:	67-59-09.29W
Heights:	806 feet site elevation (SE)
	460 feet above ground level (AGL)
	1266 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2761-OE.

**Signature Control No: 163968694-168977602**

( DNE -WT )

Michael Blaich  
Specialist



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2762-OE  
 Prior Study No.  
 2010-WTE-12559-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T13
Location:	Springfield, ME
Latitude:	45-23-50.59N NAD 83
Longitude:	67-58-28.59W
Heights:	903 feet site elevation (SE)
	460 feet above ground level (AGL)
	1363 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2762-OE.

**Signature Control No: 163968695-168977599**

Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
Federal Aviation Administration  
Southwest Regional Office  
Obstruction Evaluation Group  
2601 Meacham Boulevard  
Fort Worth, TX 76137

Issued Date: 07/17/2012

Michael Thompson  
Champlain Wind, LLC - MT  
129 Middle Street  
Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T14
Location:	Springfield, ME
Latitude:	45-23-56.96N NAD 83
Longitude:	67-58-15.83W
Heights:	847 feet site elevation (SE) 460 feet above ground level (AGL) 1307 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint only - Chapters 12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

**NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION**

OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2763-OE.

**Signature Control No: 163968696-168977888**

( DNE -WT )

Michael Blaich  
Specialist



Mail Processing Center  
 Federal Aviation Administration  
 Southwest Regional Office  
 Obstruction Evaluation Group  
 2601 Meacham Boulevard  
 Fort Worth, TX 76137

Aeronautical Study No.  
 2012-WTE-2764-OE

Issued Date: 07/17/2012

Michael Thompson  
 Champlain Wind, LLC - MT  
 129 Middle Street  
 Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T15
Location:	Springfield, ME
Latitude:	45-24-04.56N NAD 83
Longitude:	67-58-00.59W
Heights:	878 feet site elevation (SE) 460 feet above ground level (AGL) 1338 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint only - Chapters 12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION

OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2764-OE.

**Signature Control No: 163968698-168977886**  
Michael Blaich  
Specialist

( DNE -WT )



Mail Processing Center  
Federal Aviation Administration  
Southwest Regional Office  
Obstruction Evaluation Group  
2601 Meacham Boulevard  
Fort Worth, TX 76137

Issued Date: 07/17/2012

Michael Thompson  
Champlain Wind, LLC - MT  
129 Middle Street  
Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T16
Location:	Springfield, ME
Latitude:	45-24-10.93N NAD 83
Longitude:	67-57-47.83W
Heights:	930 feet site elevation (SE)
	460 feet above ground level (AGL)
	1390 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2765-OE.

**Signature Control No: 163968700-168977600**  
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Specialist

( DNE -WT )



Mail Processing Center  
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Southwest Regional Office  
Obstruction Evaluation Group  
2601 Meacham Boulevard  
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Issued Date: 07/17/2012

Michael Thompson  
Champlain Wind, LLC - MT  
129 Middle Street  
Portland, ME 04101

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Met Tower TMT 15 12-N-0532.ME.001
Location:	Springfield, ME
Latitude:	45-24-04.56N NAD 83
Longitude:	67-58-00.59W
Heights:	878 feet site elevation (SE) 295 feet above ground level (AGL) 1173 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, paint/red lights - Chapters 3(Marked),4,5(Red),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 01/17/2014 unless:

- the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- extended, revised, or terminated by the issuing office.

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OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

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If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2927-OE.

**Signature Control No: 164293735-168977479**  
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Issued Date: 07/17/2012

Michael Thompson  
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**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Met Tower TMT 16
Location:	Springfield, ME
Latitude:	45-24-10.93N NAD 83
Longitude:	67-57-47.83W
Heights:	930 feet site elevation (SE) 295 feet above ground level (AGL) 1225 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, paint/red lights - Chapters 3(Marked),4,5(Red),&12.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)  
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

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This determination expires on 01/17/2014 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.

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OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

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If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2928-OE.

**Signature Control No: 164293737-168977480**  
Michael Blaich  
Specialist

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Aeronautical Study No.  
 2012-WTE-2929-OE

Issued Date: 07/17/2012

Michael Thompson  
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**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Met Tower PMT 15_16
Location:	Springfield, ME
Latitude:	45-24-14.93N NAD 83
Longitude:	67-57-57.09W
Heights:	914 feet site elevation (SE) 295 feet above ground level (AGL) 1209 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, paint/red lights - Chapters 3(Marked),4,5(Red),&12.

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If we can be of further assistance, please contact our office at (404) 305-7081. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2012-WTE-2929-OE.

**Signature Control No: 164293738-168977481**  
Michael Blaich  
Specialist

( DNE -WT )

Review of the Bowers Wind Project Visual Impact Assessment by James F.  
Palmer  
Prepared for DEP February 18, 2013

Part 1: Adequacy

**Review of the  
Bowers Wind Project  
Visual Impact Assessment**

**Part 1: Adequacy**

**James F. Palmer**

Scenic Quality Consultants  
Burlington, Vermont

Prepared for  
Department of Environmental Protection  
Augusta, Maine

February 18, 2013

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## 1. Introduction

On October 25, 2012, Maine's Department of Environmental Protection (DEP) accepted as complete Champlain Wind LLC's permit application for the Bowers Wind Project. This project has a nameplate capacity of 48 megawatts (MW). The turbines are located on the ridges of Bowers Mountain, and Dill Hill in Kossuth Township, Washington County, Maine. The project is within the area designated for expedited grid-scale wind development. The generation facilities include:

- **Turbines.** Sixteen Vestas V112 3.0 MW wind turbines are assumed for the VIA, though a smaller turbine is also being considered. The height to the hub center is 84 meters (approximately 275 feet), plus 56 meters (approximately 184 feet) for the rotor blades, resulting in a total height of 140 meters (459 feet) to the tip of an upright blade. The turbines will be painted a light or white color. Red warning lights will be installed according to Federal Aviation Administration (FAA) guidelines. Typically lights are placed on the ends of a turbine string, and on alternating turbines between them. Champlain Wind LLC indicates that they will install a radar-assisted warning lights when they are approved for use by FAA.
- **Mountaintop collector line.** A 34.5 kV overhead collector line runs between the turbines. The wooden poles will range between 35 to 60 feet high and require an 80-foot cleared right-of-way. By and large, the mountaintop collector line is not adjacent to the ridgeline crane path.

Associated facilities include:

- **Roads.** The access road from Route 6 will be 24 feet wide and the ridgeline crane path will be 35 feet wide. There appear to be 8.1 miles of access road and 3.8 miles of crane path profiled in the Summit Civil and Electrical plans (Exhibit 1A). Of this there will be 3.0 miles of new access road and 4.0 miles of new crane path.
- **Turbine pads.** An area of approximately 3 acres or more will need to be cleared around each turbine to facilitate construction. Following construction, stockpiled topsoil will be spread on all but a small area around each turbine and will be revegetated using both seeding and natural revegetation. The VIA indicates that the turbine pads and other disturbed area around the turbines will be revegetated following construction.
- **Building.** An approximately 7,000 square foot single-story Operations and Maintenance building is located north of Route 6, adjacent to the express collector line.
- **Meteorological towers.** There will be one permanent 90-meter (295-foot) guyed lattice meteorological (met) towers. Two addition 90-meter met towers may be temporarily erected, but they will be removed before the completion of construction. The met towers will have a triangular cross section of approximately 18 inches on a side. Met towers will require FAA safety lighting and will be painted a distinctive color pattern.
- **"Express collector" line and substation.** An above ground 34.5 kV express collector line system will bring power from the towers to a new substation where it connects to an existing 115 kV transmission line. The wooden poles will be 40 to 80 feet tall. The 100-foot wide (up to 150-feet at corners) right-of-way will be approximately 5.25 miles long.

The report entitled *Visual Impact Assessment for the Bowers Wind Project* by LandWorks was submitted as part of Champlain Wind, LLC's permit application (LandWorks 2013).<sup>1</sup> A series of clarifying questions probing the adequacy of the visual impact assessment (VIA) was submitted to DEP on January 8, 2013; additional questions concerning the user surveys was submitted to DEP on January 16. Fieldwork investigating potential scenic impacts to scenic resources of state or national significance (SRSNS) was conducted on May 18-19, 2011 and December 13, 2013. This review reports the findings of additional analyses of the Bowers Wind Project's potential visual impacts, followed by an independent evaluation of the potential visual impacts to state and nationally significant scenic resources, using the Evaluation Criteria presented in the Wind Energy Act. These criteria and how they are interpreted for this review are described Appendix 1. The final section of this report presents the Conclusions of the review.

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<sup>1</sup> For the purposes of this review, aesthetic, scenic and visual impacts will be considered synonymous.

## 2. Adequacy of the Report

There is a standard process that is followed by all VIAs, which includes: (1) project description, (2) landscape character, (3) visibility analysis, (4) significant scenic resources, (5) public use and expectations, and (6) evaluation of potential impacts. This section reviews what the *Visual Impact Assessment* for the *Bowers Wind Project* and the *Visibility of Associated Facilities from Local Public Viewpoints* by LandWorks (2012) reported for each portion of the standard VIA process. This includes an intercept survey of people using three lakes that are SRSNS within 8 miles of the Bowers Wind Project (Kleinschmidt 2012a) and a second survey of users of Baskahegan Lake, which has unobstructed views toward the operating Stetson Wind Project (Kleinschmidt 2012b). There is also an expert review of the methods and interpretation of these surveys by Kevin J. Boyle (2012). In addition, the geographic information system (GIS) data used for the VIA are reviewed and additional analysis conducted. In particular, a standard visibility analysis was performed using ArcMap software, and the visual simulations were compared to a three-dimensional ArcScene model to determine representational accuracy.

### 2.1 Project Description

The project's elements are described (LandWorks 2012, pages 17-19), but a few useful descriptive details are left out. For instance, how large is the clearing around the turbine (i.e., turbine pads), are there any areas with significant cuts or fills, and how will the clearings be revegetated?

### 2.2 Landscape Character

The VIA describes the landform, water resources, vegetative patterns and cultural character of the area surrounding the proposed project (LandWorks 2012, pages 19-25). The major features are identified, including each of the state or nationally significant scenic resources, as well as some locally significant scenic resources. The area is characterized as a working landscape with very low population density. It is noted that there are working forest conservation easements on much of the area to the south of the project. Much of the residential development is on the lakeshores; in particular Bottle Lake is one of the most developed lakes in the state.

### 2.3 Significant Scenic Resources

The VIA identifies all of the state and nationally significant scenic resources within 8 miles of the proposed wind turbines (LandWorks 2012, pages 27-28). The state and nationally significant scenic resources includes four great ponds with outstanding and ten with significant scenic quality. In addition, there is one site listed on the National Register of Historic Places, which was verified by the Maine Historic Preservation Commission (Mitchell 2011). Table 1 below summarizes visibility information from the VIA for the state and nationally significant scenic resources, including name, distance to nearest turbine, and number of turbines within 8 miles that are potentially visible.

There are other significant conservation lands and easements within 8 miles of the Bowers Wind Project generating facilities. For instance, the Sunrise Conservation Easement, the Farm Cove Community Forest and several Bureau of Parks and Lands holdings that are not State Parks or on the of scenic Public Reserved Lands. None of these areas appears to be an outstanding natural or

cultural feature comparable to a national natural landmark or federally designated wilderness, and therefore would not qualify as a SRSNS.

**Table 1.** Summary of Scenic Resources of State and National Significance within 8 Miles of the Generating Facilities as Identified by LandWorks<sup>†</sup>

Scenic Resources of State or National Significance in the Surrounding Area	Distance to Nearest Visible Turbine (miles)	Number of Turbines Visible w/in 8 miles
<b>Historic Sites</b>		
Springfield Congregational Church	N/A	0
<b>Great Ponds</b>		
Bottle Lake	5.1	0-10
Duck Lake	2.7	0-14
Horseshoe Lake	N/A	0
Junior Lake	3.2	0-13
Keg Lake	3.7	0-12
Lombard Lake	N/A	0
Norway Lake	N/A	0
Pleasant Lake	2.4	0-16
Pug Lake (part of West Grand Lake)	7.7	0-6
Scraggly Lake	4.1	0-16
Shaw Lake	3.5	0-14
Sysladobsis Lake	6.3	0-10
Upper Sysladobsis Lake	N/A	0
West Musquash Lake	N/A	0

<sup>†</sup> Source: LandWorks (2012, page 27-28)

## 2.4 Visibility Analysis

In the VIA, topographic and forested visibility analyses are reported for both turbine blade tips and turbine hubs (LandWorks 2012, Exhibits 1 through 4). On these maps, the number of visible turbines is shown in groups of four (i.e., 1-4, 5-8, 9-12 and 13-16 visible turbines). The VIA includes forested visibility maps for the 80-foot poles used by the express collector, O&M building and substation, the permanent met tower, and FAA warning lights atop some turbines (LandWorks 2012, Exhibits 6 through 9). On these maps, the associated facility is shown as either visible or not without an indication of number visible elements (e.g., number of poles or warning lights).

It appears that the visibility analysis used the National Elevation Dataset 1/3 Arc-Second (NED 1/3), which is “the best available raster elevation data for the conterminous United States” (USGS 2009a). The NED 1/3 arc-second data has a resolution of about 10 meters with a with  $\leq 4$  meter absolute vertical height accuracy (USGS 2009b).

The visibility map that takes into account the screening effect of forest trees used Maine Land Cover Data (MELCD) (LandWorks 2012, Exhibits 3, 4, and 7 through 9). In this case, 40 feet are

added to “areas identified as forest, which further limits and provides a better representation of potential visibility” (LandWorks 2011a, page 6). Areas considered “forest” included the following land cover classes: (41) deciduous forest, (42) evergreen forest, (43) mixed forest. These cover types are dominated by trees that are at least 5 meters (16 feet) high.<sup>2</sup> Assigning a height of 40 feet to the forest canopy is conservative, since during the fieldwork trees around the SRSNS were often measured to be 65 feet high.

In addition to the two visibility maps, Table 1 lists all of the 14 great ponds with significant or outstanding scenic value, whether they have a potential view of the project, how many turbines are potentially visible, and the distance to the nearest turbine (LandWorks 2012, p. 27). Landworks explicitly states that the number of turbines visible within 8 miles is based on of the turbine hub and incorporates screening from both landform and forest vegetation (LandWorks 2012, page 27 and Exhibit 4). However, these visibility results in Table 1 have been modified, perhaps based on field observation. For instance, a review of the visibility map provided in response to a data request shows potential visibility from West Musquash Lake of up to 6 turbine hubs in an area of 28 acres (Stantec 2012b, file topo\_veg\_hub.shp). In addition, there are many very small areas within several of the lakes that show a potential higher visibility than indicated in Table 1.

The visibility maps prepared for this review are presented in Appendix 2. There is a high correspondence between these maps and those prepared for the VIA, though there are minor differences. For instance, Exhibit 4 showing the visibility of the turbine hub after accounting for screening by forest trees shows a small are of visibility on West Musquash Lake, while this review’s Map 4 shows no such visibility. Similarly, the VIA indicates slightly greater visibility on Pug Lake than this review found. It is very likely that these differences are because the VIA visibility map included turbines that were further than 8 miles from the viewer, as long as the viewpoint is within 8 miles of any turbine (LandWorks 2012, p. 7). In contrast the visibility maps prepared for this review only considered turbines that were within 8 miles of the viewer. The Wind Energy Act stipulates that beyond 8 miles, the scenic impact of turbines is insignificant.<sup>3</sup> The number of visible turbines should drop off as viewpoints approach the edge of the 8-mile study area as shown in this review’s Map 1 Topographic Viewshed for Blade Tip, and in the VIA’s they do not.

**Distance zones.** The concept of distance zones is presented as part of the discussion of WEA Criterion F: Scope and Scale (LandWorks 2012, p. 37-38). The USDA Forest Service proposed fixed distances thresholds for distance zones, which LandWorks slightly revised—the foreground is extended from ½ mile to 2 miles. However, it is the perceptual definition of distance zones that really matters, and the very large scale and smooth surface of wind turbines confound traditional distance thresholds. So, the foreground for a wind turbine may be less than a half-mile because they are composed of smooth materials without much apparent texture, and foreground is defined as the “distance from which details can be perceived” (LandWorks 2012, page 38), such as the “small boughs of leaf clusters... clumps of wild flowers... movement of tree boughs and tree tops in moderate winds” (USFS 1995, page 4-10). Since the surface texture

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<sup>2</sup> <http://geolibportal.usm.maine.edu/geonetwork/srv/en/metadata.show?id=427>

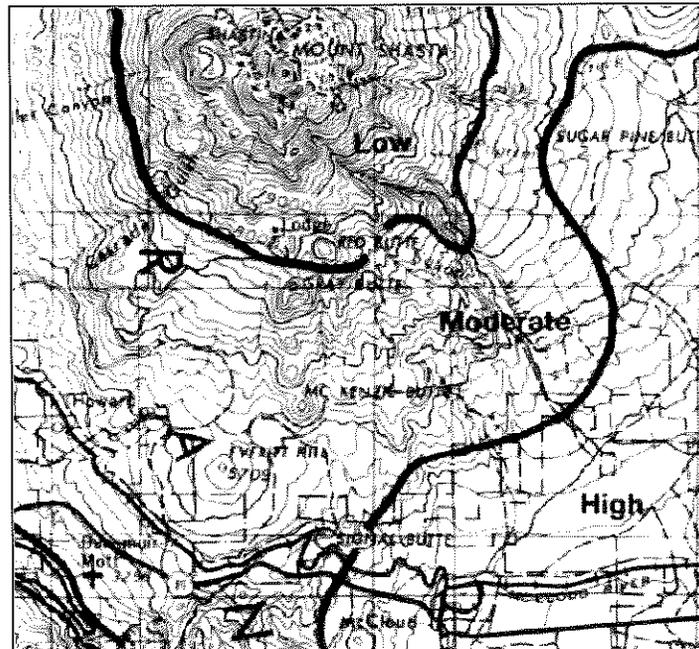
<sup>3</sup> 35-A MRSA, § 3452, §§ 3

on turbines is largely absent, the functional qualities of the visual foreground are severely limited and difficult to determine.

In the middle ground, “individual forms are still distinguishable” (LandWorks 2012, page 38). However, the middle distance for turbines may extend further than 5 miles because their basic elements are so large that they remain recognizable at distances where most naturally occurring landscape elements (e.g., trees) have ceased to be individually recognizable. The components of grid-scale turbines, particularly the blades, become difficult to recognize beyond 8 miles, which might be a better distance for a turbine’s middle distance threshold.

Background is where “texture has disappeared and color has flattened, but large patterns of vegetation or rock are still distinguished, and landform ridgelines and horizon lines are the dominant visual characteristics” (USDA 1995, p. 4-11) and atmospheric effects and distance result in a simplified image. While turbines may be visible beyond 8 miles under very good viewing conditions, they may be relatively indistinct and it may not always be possible to detect the motion of the blades. I suspect this is the reason why the threshold where wind turbines were determined to have an insignificant scenic impact was set at 8 miles by the Wind Energy Act.

**Visual absorption capability.** The VIA indicates that visual absorption is a component of determining Criterion F Scope and Scale of Visibility from the Scenic Resource (VIA p. 40). Visual absorption capability is a planning concept the US Forest Service developed to manage the potential for visual impacts associated with forest management practices such as clearcutting (USDA 1995, Appendix C). It is implemented through a rigorous mapping analysis (Anderson et al. 1979). Ridges and high slopes are least able to absorb visual change, as indicated by the visual absorption capability map in Figure 1.



**Figure 1.** This selection from a visual absorption capability map shows that peaks and steep slopes have low visual absorption and flat areas have high visual absorption (USDA 1995, p. C-7).

A moment of reflection reveals that ridges standing 700 to 800 feet above large open lakes will not absorb views of wind turbines that are 275 feet to their hub and 459 feet to an upraised blade tip, even when the ridges have a forest cover of up to 65 feet. This is why the WEA clearly states that “generating facilities are a highly visible feature in the landscape [and this] is not a solely sufficient basis for determination that an expedited wind energy project has an unreasonable adverse effect on the scenic character and existing uses related to scenic character of a scenic resource of state or national significance.”<sup>4</sup>

Visual absorption capability does not appear to have been used for visual impact assessment of projects. However, if it is going to be applied, then it requires application of clearly stated procedures implemented through a GIS analysis (e.g., Anderson et al. 1979). The Bowers Wind VIA does not present such an analysis.

## 2.5 Visual Simulations

Visual simulations are prepared for scenic resources that appear to have a potential view of turbine hubs within 8 miles of the viewer based on the results of Exhibit 4 Viewshed Map Topography and Vegetation, supplemented by field investigation.

Visual simulations are a primary tool to investigate the impact to significant scenic resources.<sup>5</sup> LandWorks prepared ten photosimulations as part of their VIA, two of which are from Pleasant Lake. Three different cameras were used, a Canon EOS Rebel XT capable of capturing an image that is 3456-by-2304 pixels, a Canon EOS D40 capable of capturing 3,888-by-2,592 pixels, and an Olympus Stylus 7010 set to capture images that are 1200-by-900 pixels. The Rebel XT use a prime lens that assures all the images had the same focal length. In this case the lens' focal length was 35 mm with a 35.2° horizontal angle of view, which is close to the convention for a “normal” lens. The Olympus camera used a zoom lens with a variable focal length. Two focal lengths were used on the EOS D40 camera, perhaps with a zoom lens. There is no way for the photographer to assure precisely what focal length is being used, as there is with a prime lens. In this case the lens was at a mild telephoto setting. Basic information about the photographs used for the simulations and their appropriate viewing distance is presented in Table 3.

**2.5.1 Image resolution.** Wind projects can extend across a large part of a view; however they are always composed of individual turbines. Visual simulations must have sufficient resolution and clarity to represent the detail of turbines (e.g., the blades) that viewers can see under good viewing conditions. One approach would be to establish the minimum resolution of a visual simulation based on the standard of “normal vision.”

“Normal vision” is based on recognition acuity, which is measured by the familiar Snelling eye chart. The eye chart is composed of letters that subtend 5-minutes of arc in overall size, with lines and gaps that subtend a 1-minute arc. Though the human eye is capable of detecting smaller elements under very good viewing conditions, “normal vision” seems like an appropriate

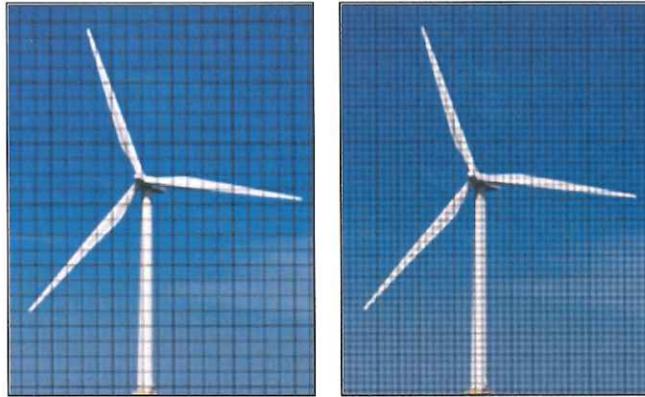
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<sup>4</sup> 35-A M RSA, § 3452, §§ 3

<sup>5</sup> The terms visual simulation and photosimulation refer to the montage of a photograph and a drawing of the proposed project that share the same viewpoint, perspective and scale. The term visualization is used to describe a perspective drawing of the landscape, including the proposed project.

standard to specify a photograph's resolution if it is going to adequately represent visual conditions. Relating this to the dimensions of a wind turbine, the widest part of a blade or the width of a nacelle (both approximately 4 meters) will occlude just over 1 minute of arc.

Conceptually, a digital photograph must have one pixel for each minute of arc. However, the pixels will not always lineup with the actual elements in the landscape (e.g., a blade tip), so the widely used rule of thumb is that the image needs twice the resolution of the target to adequately capture the desired information. This means that there needs to be two pixels for every minute of arc in the lens' view. Figure 2 illustrates the importance of pixel resolution in representing visual information.



**Figure 2.** The effect of higher pixel density for capturing image detail.

The resolution of the original photography is summarized in Table 2. Most of the images have 1.64 pixels per minute, which may be adequate but is slightly below the preferred 2.0 pixels. The Pub Lake photography had very good resolution, though it appears that the resolution may have been down sampled to make it match the other images. Only the Keg Lake image clear has inadequate resolution, which is one of its obvious faults.

**Table 2.** Apparent Resolution of Original Simulation Imagery

Simulation	Camera	Focal Length	Equivalent Focal Lens <sup>†</sup>	Horizontal Angle	Horizontal Pixels	Pixels per Minute
Bottle Lake	Rebel XT	35 mm	56.8 mm	35.2°	3456	1.64
Duck Lake	Rebel XT	35 mm	56.8 mm	35.2°	3456	1.64
Junior Lake	Rebel XT	35 mm	56.8 mm	35.2°	3456	1.64
Keg Lake	Olympus 7010	16 mm	91.1 mm <sup>‡</sup>	22.4°	1200	0.89
Pleasant Lake Boat Launch	Rebel XT	35 mm	56.8 mm	35.2°	3456	1.64
Pleasant Lake, Near Northern Shore	Rebel XT	35 mm	56.8 mm	35.2°	3456	1.64
Pug Lake	EOS D40 <sup>#</sup>	50 mm	81.1 mm	25.0°	3888	2.59
Scraggly Lake	Rebel XT	35 mm	56.8 mm	35.2°	3456	1.64
Shaw Lake	Rebel XT	35 mm	56.8 mm	35.2°	3456	1.64
Sysladobsis Lake	EOS D40	35 mm	56.8 mm	35.2°	3888	1.84

**2.5.2 Viewing Distance.** Simulations are intended to be viewed at a specific distance to place the image in proper perspective and for the image to accurately represent the visual magnitude of the wind turbines. A procedure to calculate viewing distance is described by Sheppard (1989, page 185) based on the horizontal angle imaged by the digital camera's lens and sensor. The simulations all state that the proper viewing distance is 19 inches (48.3 cm). However Table 2 indicates that the appropriate viewing distance varies slightly, perhaps because the stitched panoramic images were composed to a slightly different size for each simulation. In any case, this degree of variation is probably not significant. The one exception is the Pug Lake simulation, which should be viewed at 26 rather than 19 inches from the viewer. In other words, if viewed at 19 inches as instructed, the apparent visual magnitude of the turbines is greater than they should be.

**Table 3. Establishing Viewing Distance for the VIA Photosimulations**

Simulation	Camera	Focal Length	Equivalent Focal Lens <sup>†</sup>	Horizontal Angle	Image Width*	Viewing Distance <sup>§</sup>
Bottle Lake	Rebel XT	35 mm	56.8 mm	35.2°	11.30"	17.8"
Duck Lake	Rebel XT	35 mm	56.8 mm	35.2°	12.23"	19.3"
Junior Lake	Rebel XT	35 mm	56.8 mm	35.2°	11.99"	18.9"
Keg Lake	Olympus 7010	16 mm	91.1 mm <sup>‡</sup>	22.4°	7.40"	18.4"
Pleasant Lake Boat Launch	Rebel XT	35 mm	56.8 mm	35.2°	11.47"	18.1"
Pleasant Lake, Near Northern Shore	Rebel XT	35 mm	56.8 mm	35.2°	11.63"	18.3"
Pug Lake	EOS D40 <sup>#</sup>	50 mm	81.1 mm	25.0°	11.41"	25.7"
Scraggly Lake	Rebel XT	35 mm	56.8 mm	35.2°	11.80"	18.6"
Shaw Lake	Rebel XT	35 mm	56.8 mm	35.2°	12.17"	19.2"
Sysladobsis Lake	EOS D40	35 mm	56.8 mm	35.2°	12.07"	19.0"

<sup>†</sup> Using Canon APS-C format (22.2mm-by-14.8mm). <http://www.isotton.com/misc/lens-angle-calculator/>. A 0.179 multiplier is used for the Olympus camera.

<sup>‡</sup> Based on the specification in the Olympus Digital Camera Stylus-7010/μ-7010 Instruction Manual, page 68. [http://www.olympusamerica.com/files/oima\\_cckb/STYLUS-7020\\_MJU-7020\\_STYLUS-7010\\_MJU-7010\\_Instruction\\_Manual\\_EN.pdf](http://www.olympusamerica.com/files/oima_cckb/STYLUS-7020_MJU-7020_STYLUS-7010_MJU-7010_Instruction_Manual_EN.pdf) (Accessed February 6, 2013).

\* Simulations are a multi-frame panorama, the single frame portion is an approximation based on images provided (Stantec 2012b).

§ Viewing distance is calculated using the method described by Sheppard (1989, page 185).

<sup>#</sup> The camera is not listed in the image meta-data, but the image size is consistent with a Canon ESO D40, which was used for Sysladobsis Lake.

Photosimulations begin with the photographs described in Table 2 and 3. Field notes indicate that a GPS was used to locate simulation viewpoints, and the longitude and latitude are included with the simulations (Exhibits 6 through 13). LandWorks then built a 3-dimensional representation of the turbines as they would appear in the landscape using a CAD program (Vectorworks). This representation is registered to the location and camera setting used of the photograph. The photograph and CAD representation of the turbines are brought together in an image editing program (Photoshop). The visual effect of clearing for roads, crane paths and turbine pads

appears to have been explored using ArcScene, the same program used for the visualizations included with this review. While I have not watched LandWorks employees walk through this process, the description follows what is commonly considered best professional practice for creating photosimulations. While there is some interpretation that must be made to create photosimulations, those presented in the VIA appear generally accurate and well-constructed, as is apparent when compared to the ArcScene Visualizations in Appendix 3.

**Bottle Lake.** Visualization 1 indicates that the turbines will be less visible than Exhibit 11; however their scope and scale of are very similar. This supports the accuracy of the photosimulation.

**Duck Lake.** The scope and scale of the left half of Visualization 2 is very similar to the photosimulation in the VIA's Exhibit 12. This supports the accuracy of the photosimulation. However on the right half there are turbines apparent in the visualization that are screened in the photosimulation. This appears to be because the shoreline vegetation is much higher than represented by the visualization (which is probable). In the photograph, the tops of these trees are as high as the base of the sixth turbine from the left; it is clear that the shoreline vegetation is much lower in visualization. An approximation of the area that is screened by the shoreline vegetation is outlined by a scalloped green line. Considering this adjustment to the visualization, the whole photosimulation appears to be accurate.

**Junior Lake.** The scope and scale of Visualization 3 is very similar to the photosimulation in the VIA's Exhibit 13. This supports the accuracy of the photosimulation.

**Keg Lake.** The scope and scale of Visualization 4 is very similar to the photosimulation in the VIA's Exhibit 14. Shore vegetation at the far right side of the photosimulation is not present in the visualization, but it does not affect turbine visibility. This supports the accuracy of the photosimulation.

**Pleasant Lake Boat Launch.** The scope and scale of Visualization 5 is very similar to the photosimulation in the VIA's Exhibit 15. This supports the accuracy of the photosimulation.

**Pleasant Lake West.** The scope and scale of Visualization 6 is very similar to the photosimulation in the VIA's Exhibit 16. I believe that indications of which turbines will be lit in Exhibit 10.6 are error, but this is of minor significance. Otherwise the visualization supports the accuracy of the photosimulation.

**Pug Lake.** The Pug Lake simulation is somewhat misleading because a moderate telephoto lens with a horizontal viewing angle of 25° was use. Visualization 7-A is constructed with the same viewing angle and corresponds to the central third of the photosimulation. The turbines are more visible in the visualization because the shoreline trees that are clearly evident in Exhibit 17 are not properly displaying in the visualization. An approximation of the area that is screened by the shoreline vegetation is outlined by a scalloped green line. Considering this adjustment to the visualization, the whole photosimulation appears to be accurate.

Visualization 7-B is included to represent the visual magnitude of the turbines from Pub Lake as they are represented in the other photosimulations. The Pug Lake photosimulation gives a false impression that the turbines will appear as large as they might from Pleasant Lake.

**Scraggly Lake.** The scope and scale of Visualization 8 is very similar to the photosimulation in the VIA's Exhibit 18. While the shoreline vegetation in the photograph is slightly higher than shown on the right side of the visualization, this will not significantly change the visual exposure of the turbines from this viewpoint. This supports the accuracy of the photosimulation.

**Shaw Lake.** The scope and scale for most of Visualization 9 is very similar to the photosimulation in the VIA's Exhibit 19. It appears that the shoreline vegetation on the far left will obscure two turbines. This supports the accuracy of the photosimulation.

**Sysladobsis Lake.** The scope and scale of Visualization 10 is very similar to the photosimulation in the VIA's Exhibit 18. The shoreline vegetation in the photograph is higher than shown on the right side of the visualization, which will screen the turbines on the far right. This supports the accuracy of the photosimulation.

#### **2.5.1 Observations about the visual simulations.**

I do have several criticisms of the visual simulations prepared for this VIA. First, the VIA uses panoramic images typically composed of three photographs. This makes it very difficult to check the appropriate distance at which to view the simulations. It appears that these panoramas have been slightly resized and cropped for aesthetic reasons, which would be the cause of the slight variation in the viewing distance. This is complicated further by the use of various cameras and image resolutions—in particular the use of a moderate telephoto lens for the Pug Lake photosimulation increases the relative magnitude of the turbines if they are viewed from the recommended 19 inches. Finally, it appears that the turbines that are proposed for FAA aviation warning lights are mislabeled in Pleasant Lake West photosimulation.

This review has also shown the limitations of using ArcScene visualizations. In particular, these visualizations do not represent the foreground vegetation well. However in the case of the spatial data for the Bowers Wind Project, the land cover data frequently do not reach to the shoreline adding to this problem.

Nonetheless, I am satisfied that the simulations are generally accurate representations of how the Bowers Wind Project will appear from selected viewpoints on the SRSNS.

#### **2.6 Public Use and Expectations**

The VIA discusses public perception of wind development (LandWorks 2012, p. 46-57). In section 2.3.4 Research and Publication (p. 13-15), the VIA identifies 38 surveys and reports that it draws upon. Much of the discussion is about the public's general support for wind or involves reactions to projects far from Maine. Specifically, much of this research does not involve people who are using SRSNS making judgments about their expectations, a project's effect on their enjoyment or their continued use. It is irrelevant that "90% of Maine people support wind Power" (p. 47) or that tourists in Scotland (p. 55) or Prince Edwards Island (p. 57) generally had positive views of wind projects. In addition, there is no attempt to do a comprehensive of the

literature about perceptions of wind projects—studies that found wind projects resulted in significant negative scenic impacts are ignored or belittled.

The VIA does not seem to recognize that some surveys are more relevant than others for determining the scenic impacts from the Bowers Wind Project. There is not even an attempt to systematically summarize the results of the intercept studies that have been conducted for wind projects in Maine, as Palmer (2012) has attempted to do. However, there are four studies referenced in the VIA that were conducted specifically to evaluate how users of SRSNS would experience the proposed Bowers Wind Project. It seems reasonable to critically consider their results.

**Bowers telephone survey** (Portland Research Group 2011a). This survey attempted to contact people for whom outdoor activities were an interest. The list included 6,000 people living within 50 miles of the Bowers project, 1,000 additional Maine residents, and 4,000 from the other five New England states. From this list of 11,000 people, 191 interviews were completed, of which 31 indicated they used the study area, though it is quite possible some of these misunderstood where the area was located. It is particularly interesting because it is the first among the surveys conducted in response to the WEA’s Evaluation Criteria where fishing was the primary activity of interest to respondents using the affected area. However, there are several aspects to the survey that are problematic and significantly reduce its usefulness:

- No user estimates can be made because of the nature of the sample. As a result, the survey cannot be used to estimate the “extent, nature, and duration of potential affected public uses”<sup>6</sup> of the area.
- Because the survey did not use visual simulations, there is no information about the scenic value of the existing conditions in this area, or the perceived visual impact from specific locations if the Bower Wind Project were constructed.
- Without a clear understanding of the visual scope and scale of the turbines, it is difficult to see how respondents can accurately determine how the turbines would affect their “continued use and enjoyment of the scenic resource.”<sup>7</sup> We do not know whether they are imagining turbines 2 miles or 12 miles away.

The results of this survey do not appear to be useful for addressing the WEA evaluation criteria.

**Bowers intercept survey** (Kleinschmidt 2012a). This is the first survey conducted for a wind project that intercepted users on lakes of scenic significance; previous surveys of lake users intercepted them at a boat launch or parking area. Interviews were conducted on Junior, Pleasant and Scraggly Lakes on 12 days between May 25 and August 11, 2012. Of the 486 people observed, 70 eligible people were approached and they all agreed to be interviewed.

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<sup>6</sup> 35-A MRSA, § 3452, sub-§3(E)

<sup>7</sup> 35-A MRSA, § 3452, sub-§3(E)

Overall, the conduct of this survey appears meet best professional practice for a recreation survey. However, the wording for the question about how the visual change will affect the user's continued use seems to have drifted, which may have caused a problem. When the question was asked for the Saddleback Ridge Wind Project it was: "On a scale of 1-7 where 7 means you are more likely to return and 1 means you are less likely to return... [and] a '4' means the change in the view would have no effect on your return." However, question 20 on the Bowers survey is: "On a scale of 1 to 7, where a 1 means you are very unlikely to return, a 4 means the change in view would have no effect on your return, and a 7 means you are very likely to return, how likely are you to return." Emphasis is added to highlight the change from more or less likely to very likely or unlikely.

Assume that I am a long time user of Junior Lake who is on the water at least once a week during fishing season (30 or more time a year) and scenic value has nothing to do with why I am on the lake. Using the earlier form of the question, I would respond that it has no effect—I will neither be more nor less likely to return. However, I would be uncertain of how to respond to the question as stated on the Bowers survey—it will have no effect (i.e., 4) but I am also "very likely to return" (7).

The results for the Bowers intercept survey found that 19 percent of the respondents indicated the proposed scenic change would have no effect, and 61 percent indicated that they were likely to visit again. In his review of Kleinschmidt's surveys, Boyle (2012) summarized the continued use responses for the 10 other surveys conducted for Maine wind projects. His table 3 (Boyle 2012, p. 12) that between 50 and 81 percent of respondents indicated that the change would have no effect on their continued use; between 0 and 27 percent indicated they were likely to continue to use the lake. An anomalous response of this magnitude leads one to question whether the change in wording may be responsible.

However, the other results are comparable to the responses from previous intercept surveys (Palmer 2012). The effect size of the scenic impact shown in Table 4 is very large (i.e., beyond the threshold of -1.1), which is indicative of projects that cause controversy over scenic impacts.

**Table 4.** Effect size of the Bowers Wind Project's scenic impact

Lake	Existing View		Proposed View		Pooled Std. Dev.	Effect Size
	Mean	Std. Dev.	Mean	Std. Dev.		
Junior Lake	7.923	1.592	3.769	3.386	2.646	-1.570
Pleasant Lake	8.800	1.442	5.650	3.351	2.580	-1.221
Scraggly Lake	8.500	1.369	3.077	3.155	2.432	-2.230

Note: The number of respondents at Junior is 26, at Pleasant it is 30 and at Scraggly it is 13.

However, the WEA evaluation criteria do not include the perception of scenic impact per se, but how the scenic impact will affect the enjoyment and continued use of the SRSNS. The results for effect on enjoyment are shown in Table 5. Based on the rule of thumb presented by Stamps (2000, p. 162; Cohen 1988, p. 24-27), the effect on enjoyment to users of Pleasant Lake is moderate and on Scraggly Lake it is too small to be noticed. However, the effect to users of Junior Lake is large—certainly adverse and possibly unreasonably adverse. This effect is comparable to that found by the Passadumkeag Wind intercept survey at Saponac Lake (effect size = -0.746) and Lower Pistol Lake (effect size = -0.691).

**Table 5.** Effect size for the Bowers Wind Project's effect on enjoyment

Lake	Mean	Std. Dev.	Number	Effect Size
Junior Lake	3.580	3.047	25	-0.630
Pleasant Lake	4.950	2.444	30	-0.225
Scraggly Lake	5.000	3.344	12	-0.150

Note: Effect size is based on the change from the neutral rating of no effect on enjoyment.

This survey appears to have been conducted using best professional practices for a recreation survey. It is the first intercept survey that approached people engaged in activities on lakes that were SRSNS, rather than as they were entering or leaving. The results should be useful when considering the WEA evaluation criteria.

**Snowmobiler survey** (Portland Research Group 2011b). This was an intercept survey of adults who attended the Second Annual Stetson Wind Snowmobile Ride-In at First Wind's Stetson Mountain facility. It is estimated that 150 people were in attendance, though an unknown number of these were younger than 18 years old. A total of 69 useable responses were obtained.

This survey is of particular interest because it is the first attempt to understand how snowmobilers might experience wind projects and their scenic impacts, though it is not clear what SRSNS are being used by snowmobilers. However, the survey is sponsored by and conducted in the shadow of a large wind project. Therefore the respondents are primarily a self-selected group that is willing to at least tolerate the presence of grid-scale wind turbines. Because of this flaw, it is unclear what can be learned about how typical snowmobilers might experience wind power projects or scenic quality of the surroundings.

**Baskahegan survey** (Kleinschmidt 2012b). This survey is the first attempt to look at the scenic impacts from a built wind project in Maine. The survey was conducted at the Baskahegan Lake boat launch, which has a clear view of the Stetson Wind Project over 9.3 miles away. However, the survey was not designed to understand how construction of a wind project could change scenic quality, enjoyment or continued use. For instance, respondents were asked generally how they would rate the views around Baskahegan Lake rather than have them rate specific views with and without the Stetson Wind Project. As a result, there is no way to measure change in scenic value or investigate the effect of causal variables, such as the number of turbines visible, the distance to turbines, or the horizontal angle of view occupied by the turbines. A possibly greater problem is that it asked existing users—former users who find the project so objectionable that they will no longer use Baskahegan Lake would not be represented in this survey.

It is possible to design a survey to correct these problems. Ideally it would ask the same users about their perceptions before and after construction of a project—Palmer (1996) conducted such a study of the first grid-scale wind project east of the Mississippi River using a randomly selected panel of residents living in neighboring towns. However, a more expedient research design would simply replicate the existing intercept surveys at the same interview location after the projects are constructed. While the respondents may not be the same in both surveys, it may be possible to weight the respondents for relevant demographic factors to increase the

comparability of the two groups. This type of monitoring survey should be a standard requirement of all permits.

## 2.7 Evaluation of Potential Scenic Impacts

Logically, the information about the project, surrounding area, and scenic resources' character and use should be presented first in a VIA. Then the scenic impact and whether it is Not Adverse, Adverse, or Unreasonably Adverse can be systematically evaluated by applying the Evaluation Criteria to what is presented about each scenic area and their views of the proposed development.

Essentially, this is what LandWorks has done in the *Visual Impact Assessment for the Bowers Wind Project* by summarizing their interpretation of the data relevant to each evaluation criterion and then presenting their rationale for the overall scenic impact to each SRSNS with views of the project.

The VIA evaluates nine of the fifteen state or nationally significant scenic resources within 8 miles of the proposed turbines. The six not evaluated are those listed in Table 1 (LandWorks 2011a, Page 20) as not having any visibility of turbines: Springfield Congregational Church, Horseshoe Lake, Lombard Lake, West Musquash Lake, Norway Lake and Upper Sysladobsis Lake. It should be noted that Exhibits 3 and 4, the viewshed maps for blade tips and turbine hubs based on the screening effect of topography and vegetation indicate a small area with potential turbine visibility on West Musquash Lake. However, it appears that the visible turbines are further than 8 miles away (VIA p. 2), and the WEA specifies that the scenic impact beyond 8 miles is insignificant.

### 2.7.1 Bottle Lake

**A. Significance.** Bottle Lake is listed as a Great Pond with a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine's Unorganized Towns* (Jones 1986).

Scenic Attributes	Rating for Bottle Lake
Relief (30)	Low (10)
Physical features (25)	Med (15)
Shore configuration (15)	Low (5)
Vegetation diversity (15)	Low (5)
Special features (15)	None (0)
Inharmonious development (-20)	Lo/N (0)
Total (100)	35

A "significant" scenic lake would fall to the level of being not significant if its rating were below 20 points. Therefore Bottle Lake's status would have been safe if the project had been in operation at the time of the *Evaluation*, since the maximum number of points that could be

subtracted for the potentially inharmonious wind turbine visibility would be 10—the additional 10 points appear to be reserved for drastic fluctuations in water level (Jones 1986, page 13).

The *Maine Wildlands Lake Assessment*, which is based on the 1986 *Scenic Lakes Character Evaluation in Maine's Unorganized Town's*, is the legal record identifying great ponds that are SRSNS.<sup>8</sup> The VIA notes that the 1986 *Scenic Lakes Character Evaluation in Maine's Unorganized Town's* does not assign negative points for “Inharmonious Development” on Bottle Lake. The VIA concludes that “This is an indication of the dramatic change of land use over 25 years and that the ‘Evaluation’ may be outdated and unreliable for some of these lakes.” However, Figure 3 the 1988 USGS 1:24,000 topographic map indicates over 80 structures on the lakeshore. Therefore, it is safe to assume that Bottle Lake was a highly developed lake in 1986 when the evaluation was conducted and its authors either (1) did not find this development to be inharmonious, or (2) made an error.



**Figure 3.** The 1988 USGS 1:24,000 topographic map indicates over 80 structures on the lakeshore of Bottle Lake.

The VIA states that Bottle Lake “has an undifferentiated landscape and does not have any unique or outstanding qualities or geomorphic elements” (VIA p. 58). This is the first occurrence of “uniqueness,” which is often invoked as an important threshold for several evaluation criteria. However, the only explanation of uniqueness is in Diagrams 3 and 4 (VIA p. 33), and it is unclear whether attributes of the SRSNS must be unique within the context of the surrounding region for an evaluation criterion to be rated high. In addition, it is unclear whether uniqueness in and of itself warrants a high rating. For instance, Bottle Lake’s shoreline apparently has the highest development density of any lake in LURP’s jurisdiction (much larger than just regional)—should this uniqueness be recognized by assigning a High rating to Criteria A or B?

The VIA also indicates that Bottle Lake has been assigned a Management Class of 5 by LURC. While this may be useful contextual information, it is not revealed how this is directly relevant to the Wind Energy Act’s first Evaluation Criterion.

<sup>8</sup> 35-A MRSA, § 3451, §§ 9 (D) (2)

**B. Existing Character of the Surrounding Area.** The lake's location, size (258 acres), land cover (mixed forest), topography (low-lying hills and mountains), and distance to the nearest proposed turbines (5.1 miles) are stated. The direction of the most prominent view is identified (northwest), and its characteristic features identified (Lombard and Almanac Mountains). The area from where Bowers Mountain is visible is also identified (small southwestern portion of the lake). I found the aerial photo of the lake with cultural features indicated to be very informative.

Bottle Lake is described as the most densely developed lake in the study area, with roughly 100 camps or homes along the shoreline, many with little screening. The resulting character is described as "rural recreational, developed lake." Other signs of development include power lines and a communications tower, though their prominence is uncertain. Based on the photographs in the VIA and Photo Inventory, it seems reasonable that Bottle Lake would now be assigned negative points for Inharmonious Development. On the other hand, the presence of many docks and recreation equipment is an indication that Bottle Lake may be more heavily used when compared to the other lakes.

Criterion B. Existing Character of the Surrounding Area has been interpreted as the character visible from Bottle Lake. In general, the text seems to present an adequate description, though there is little or no description of the "physical features" of the lake that were the most important element contributing to the 1986 scenic evaluation.

On the other hand, "surrounding area" might refer to the Downeast Lakes region, not just the area within 8 miles of the project's generation facilities or the area visible from the SRSNS, as it appears to be interpreted here. If this were the case, one would expect a description how to consider the scenic quality and recreation use of Bottle Lake compared to other resources, especially SRSNS, within this region. Is Bottle Lake special or unique (a term favored in the VIA) in this context? If users chose not to return to Bottle Lake because of Bowers' scenic impact, are there comparable opportunities within the region that will not be impacted by any existing or proposed wind energy project?

**C. Typical Viewer Expectations.** There is no user survey data for Bottle Lake. This section identifies recreation uses, but does not discuss typical viewer expectations.

The VIA observes that "this is one of the most developed lakes in LURC's jurisdiction" and then concludes that users "users must expect to see evidence of that development." I might follow the same line of thinking myself, but I have also worked on projects (e.g., the review of the Plum Creek Concept Plan) where people testified that heavily harvested lands were "wilderness" and "wild." I agree with LandWorks that this is a very developed lake; however, I also observed that vegetation effectively screens most of the structures. It is possible that many users find the lake's development to fit harmoniously with nature—we simply do not know because we have not asked.

**D. Purpose and Context of the Proposed Activity.** The WEA scenic evaluation criteria require the permitting agency to consider this criterion.<sup>9</sup> The VIA states that this criterion "is a more

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<sup>9</sup> 35-A MRSA, § 3452, §§ 3 (D)

general requirement that the agency consider state policy to encourage the siting of wind energy projects within the expedited permitting area when determining the reasonableness of the visual impacts" (VIA p. 36). The VIA's Table 2 Summary of Statutory Criteria's Effect on Scenic Impact (VIA p. 105) assigns a Low effect on scenic impact to this criterion, even though it is not discussed. However, the legislature saw fit to specifically include Purpose and Proposed Context as a scenic impact criterion. One must assume that the legislature intended all the criteria to be applied when evaluating scenic impacts (not just when the permitting agency weighs all factors in making a final determination). Possible interpretations of how to apply this criterion that come to mind include: (1) the cumulative scenic impacts from wind energy development, (2) reduced scenic impacts from sharing existing or proposed infrastructure, or (3) whether users displaced from an adversely impacted SRSNS have suitable alternative use areas nearby. It seems inappropriate not to provide a substantive discussion of the effect of Criterion D on the scenic impact of a proposed project.

**E.1 Extent, Nature and Duration.** There are no studies of recreation use of Bottle Lake. Common uses are asserted to be boating, water skiing, paddling, fishing, and swimming; while winter activities include snowmobiling. Jet skiing is not mentioned, but it camp owner thought that it was sufficiently problematic as to ask for responsible jet-skiing.<sup>10</sup> There is a quasi-public motorboat launch and a 2-mile stream connection to Junior Lake. Bottle Lake is an access point for Junior Lake, because it does not have its own boat launch. The VIA also indicates that there is a half-mile portage to Lower Sysladobsis Lake. Due to the high level of development, the number of people participating in these activities is assumed to be the highest of the lakes evaluated.

Nighttime use of Bottle Lake is not discussed. There are a number of houses on the south shore where there is the greatest potential for visibility of the turbines and FAA aviation warning lights. As large openings in a largely forested landscape, great ponds facilitate stargazing. It is unclear whether star gazing from the shore is a use of the SRSNS; certainly stargazing from a boat or a dock over the water would be.

It is reasonable to expect the lake to be heavily used because it is one of the most developed lakes in Maine. However, there must be more reliable procedures to estimate the extent (numbers of people), nature (types of activities) and duration (how long people are engaged) of use. Some creative thinking needs to be done about how to develop this information in a cost effective manner.

**E.2 Effect on Continued Use and Enjoyment.** There are no studies of how additional development, including wind energy, would affect user enjoyment and continued use of Bottle Lake. However, the VIA asserts that the effect to enjoyment and continued use will be low because the lake is densely developed, has high use, and is used as a passage to other lakes. No support is given to explain why these three factors would lead to a low rating for the effect on enjoyment and continued use.

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<sup>10</sup> A request for responsible jet-skiing is found in the 2003 Bottle Lake Campowner Newsletter (Accessed January 2, 2013) [http://thelcoa.org/documents/bottle\\_lake\\_newsletter\\_2004.htm](http://thelcoa.org/documents/bottle_lake_newsletter_2004.htm).

**F. Scope and Scale of Visibility.** The VIA identifies that up to 10 turbine hubs may be visible at a distance of over 5 miles from the southern side of the lake, while there will be no visibility from the northern side.<sup>11</sup> The photosimulation in Exhibit 11 shows seven turbine hubs and an additional blade tip that are seen from one of the locations with the highest potential visibility. These turbines span an arc of 7°. This reduced visibility appears to be from the presence of shoreline vegetation that is taller than represented in the viewshed models.

The VIA assert that “the ordered distribution of turbines along the ridge presents a harmonious layout and does not create visual clutter” (VIA p. 61). I am uncertain how these turbines represent an “orderly distribution,” the turbines appear to be unevenly spaced and at slightly different elevations. Others will contest whether visible turbines create visual clutter or not. There is no need to insert harmonious fit into the discussion, since the WEA specifies that wind energy development is not required to “fit harmoniously into the existing natural environment.”<sup>12</sup> However, once the assertion is made it needs to be supported.

Nighttime visibility of the FAA warning lights is not discussed, though Exhibits 9 and 10.1 indicate they will be visible.

**G. Overall Scenic Impact.** A procedure for combining the evaluation criteria into an overall assessment of scenic impact that is clear, reliable and valid is not presented. However the VIA presents a rationale for the reasons why it thinks that the overall impact will be Low.

The difficulty with such an open narrative approach is that it only considers those factors that support its conclusion; there is no way to be certain that non-conforming factors are given their proper weight. Opponents to the project would just select other factors to reach the opposite conclusion. Ideally a procedure for combining the evaluation criteria would be developed outside of the exigencies of a particular project, and then applied consistently across SRSNS.

### 2.7.2 Duck Lake

**A. Significance.** Duck Lake is listed as a Great Pond with a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine’s Unorganized Towns* (Jones 1986).

A “Significant” scenic lake is one with 20 or more points. If the project had been in operation at the time of the *Evaluation* and the turbines were considered “Inharmonious Development,” the effect could be to demote Duck Lake to the status of not having significant scenic value.

<sup>11</sup> The text in the Bottle Lake assessment does not specify which viewshed analysis is used for these figures. However, the VIA states that “the numbers of turbines visible and percent of visibility represented in this analysis are taken from viewsheds generated from the hub” and the visibility analysis of the turbine hub that includes vegetative screening “represents the most reasonable approach to potential visibility, since turbine blades that rise above treeline are not typically visible or dominant” (VIA p. 6).

<sup>12</sup> 35-A MRSA, § 3452, §§ 1

The VIA also indicates that Duck Lake has been assigned a Management Class approaching 5 by LURC. While this may be useful contextual information, it is not revealed how this is directly relevant to the Wind Energy Act's first Evaluation Criterion.

Scenic Attributes	Rating for Duck Lake
Relief (30)	Low (10)
Physical features (25)	Med (15)
Shore configuration (15)	Low (5)
Vegetation diversity (15)	None (0)
Special features (15)	None (0)
Inharmonious development (-20)	Lo/N (0)
Total (100)	25

**B. Existing Character of the Surrounding Area.** The lake's location, size (262 acres), land cover (mixed forest), topography (low-lying hills and mountains), and distance to the nearest proposed turbines (2.5 to 3.2 miles) are stated. The direction of the most prominent view is identified (north), and its characteristic feature described (Getchell Mountain). The area from where Bowers Mountain is visible is also identified (southern shoreline). Duck Lake also has approximately 37 camps along its wooded shoreline. The landscape character of Duck Lake seems to be aptly described as "rural recreational developed lake." I found the aerial photo of the lake with cultural features indicated to be very informative.

See Bottle Lake's Criterion B for a discussion of alternative ways that Existing Character of the Surrounding Area might be interpreted (page 16 of this review).

**C. Typical Viewer Expectations.** There is no user survey data for Duck Lake. This section identifies recreation uses, but does not discuss typical viewer expectations. The VIA asserts that "it cannot be assumed that their expectations for a pristine environment are high" (VIA p. 64). While I agree that Duck Lake is not pristine (i.e., untouched by people), I can fully imagine (but do not know for sure) people coming to their camp on Duck Lake and talking to a neighbor about how good it is to get away to the unspoiled natural conditions at Duck Lake. This issue is also discussed under Bottle Lake's Criterion C (page 16 of this review).

**D. Purpose and Context of the Proposed Activity.** This criterion is not discussed, though a Low rating is shown in Table 2 Summary of Statutory Criteria's Effect on Scenic Impact (VIA p. 105). The possible meaning of this criterion is discussed under Bottle Lake's Criterion D (page 16 of this review).

**E.1 Extent, Nature and Duration.** There are no studies of recreation use of Duck Lake. Common uses are asserted to be fishing, boating, paddling and snowmobiling, but not swimming. There is a boat launch and Duck Lake is connected to Junior Lake by a quarter-mile stretch of stream. This lake is identified as having 37 structures, which may well generate

significant seasonal use. For instance, it may not be a fishing destination, but there may be quite a few people pan fishing. It is simply unknown.

Nighttime use is not discussed. This issue is discussed further under Bottle Lake's Criterion E.1 (page 17 of this review).

**E.2 Effect on Continued Use and Enjoyment.** There are no studies of how additional development, including wind energy, would affect user enjoyment and continued use of Duck Lake. However, the VIA asserts "that scenic expectations are low for this resource due to existing development, low use, and nature of the activity, the Project's impact on likelihood to return is also considered low" (VIA p. 65). However, there is no specific evidence cited for these assertions.

**F. Scope and Scale of Visibility.** The VIA identifies that up to 14 turbine hubs may be visible from the southern side of the lake, while there will be no visibility from the northern side.<sup>13</sup> The VIA states that the most probable route between the boat launch and Junior Lake will hug the northern shore and not have visibility. The photosimulation in Exhibit 12 shows the Bowers Mountain ridgeline and six turbine hubs at a distance of 3 to 4 miles from one of the points of highest visibility on the lake. Clearing from the crane paths and turbine pads will be apparent as breaks in the tree line along the ridge. The top of one additional turbine is seen just above the top of shoreline trees to the east. These turbines span an arc of 8°. This reduced visibility appears to be from the presence of shoreline vegetation that is taller than represented in the viewshed models.

The VIA states that "the turbines will not appear prominent, even those within the foreground view at 2.7 miles, since they are not in the center of an important view, nor are they in close visual association with an important natural or cultural focal point" (VIA p. 65). The reasoning behind this statement is not clear. Criterion B states that "the most prominent topographic feature from Duck Lake is nearby Getchell Mountain to the north" (VIA p. 64) and the turbines will be visible just to the east of Getchell Mountain. In addition the several of the turbines will reach the same apparent height as Getchell Mountain in the photosimulation (Exhibit 12), and it is expected that their "prominence" will be enhanced by the rotating blades.

The lack of support for the claim that the turbines represent a "harmonious layout" is discussed in Bottle Lake's Criterion F (page 17 of this review).

Nighttime visibility of the FAA warning lights is not discussed, though Exhibits 9 and 10.2 indicate they will be visible.

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<sup>13</sup> The text in the Bottle Lake assessment does not specify which viewshed analysis is used for these figures. However, the VIA states that "the numbers of turbines visible and percent of visibility represented in this analysis are taken from viewsheds generated from the hub" and the visibility analysis of the turbine hub that includes vegetative screening "represents the most reasonable approach to potential visibility, since turbine blades that rise above treeline are not typically visible or dominant" (VIA p. 6).

**G. Overall Scenic Impact.** The rationale for the Low overall scenic impact ratings is not laid out as clearly as for Bottle Lake. In particular, it is unclear how the statement that “the visibility of the Bowers Project on Duck Lake is limited” when there will be visibility from over half of the lake (VIA p. 67). In addition, the VIA states that: “in fact, the communications tower on Almanac Mountain is readily visible to the west of the lake at 2 miles to the closest shoreline.” How can the scenic impact of a 255-foot tall communications tower that requires a zoom lens to be visible in Exhibit 5: Photo Inventory be considered as competing for viewer attention compared to the six 459-foot tall wind turbines with rotating blades?

No procedure for combining the evaluation criteria into an overall evaluation is presented. This concern is discussed in Bottle Lake’s section G (page 18 of this review).

### 2.7.3 Junior Lake

**A. Significance.** Junior Lake is listed as a Great Pond with a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine’s Unorganized Towns* (Jones 1986).

A “Significant” scenic lake would fall to the level of being not significant if its rating were below 20 points. Therefore Junior Lake’s status would have been safe if the project had been in operation at the time of the *Evaluation*, since the maximum number of points that could be subtracted for the potentially inharmonious wind turbine visibility would be 10—the additional 10 points appear to be reserved for drastic fluctuations in water level (Jones 1986, page 13).

Scenic Attributes	Rating for Junior Lake
Relief (30)	Low (10)
Physical features (25)	Med (15)
Shore configuration (15)	Med (10)
Vegetation diversity (15)	Med (10)
Special features (15)	None (0)
Inharmonious development (-20)	Lo/N (0)
Total (100)	45

The VIA also indicates that Junior Lake has been assigned a Management Class of 7 by LURC. While this may be useful contextual information, it is not revealed how this is directly relevant to the Wind Energy Act’s first Evaluation Criterion.

**B. Existing Character of the Surrounding Area.** The lake’s location, size (4,000 acres), land cover (mixed forest), topography (low-lying hills and mountains) and distance to nearest turbine (3.2 miles) are stated. There are approximately 87 camps and homes, many of them recently constructed with screened set-backs, mostly along the western shore. The sports camp formerly known as Wild Fox Resort is located in a cove at the southeastern corner of the lake. It does not

appear to be currently open, and was apparently for sale recently.<sup>14</sup> I found the aerial photo of the lake with cultural features indicated to be very informative.

The VIA states that “the character of this lake is not unique to the region with low hills and mixed forest cover” (VIA p. 68). It is unclear what this sentence means. It may be that the region is characterized by low hills (elevation between 700 to 1,100 feet) and mixed forest cover, but neither of these characteristics relate to lake character. The sentence might better describe the character of lakes in the region, and evaluate how Junior Lake compares to that. See Bottle Lake’s Criterion A for more discussion of the role of uniqueness as a standard for the evaluation criteria (page 15 of this review).

See Bottle Lake’s Criterion B for a discussion of alternative ways that Existing Character of the Surrounding Area might be interpreted (page 16 of this review).

**C. Typical Viewer Expectations.** Junior Lake is one of the SRSNS where users were surveyed (Kleinschmidt 2012a). The VIA states that “evidence suggests that viewer expectations could be lower based on the most common recreational activities on the lake (i.e. fishing and boating)” (VIA p. 67). However, the survey results for Junior Lake indicate that everyone expected they would have a positive experience and 73 percent expected their experience would be of “very high quality.”<sup>15</sup> In addition, it appears that scenery may be part of the experience of people who are primarily fishing. Eighty-two percent of those who indicated “fishing from a boat or shore” was their primary activity also indicated that they engaged in “viewing scenery.”<sup>16</sup> There are too few respondents who were primarily boating to calculate the role of viewing scenery for that group.

As part of Criterion C, the VIA discusses results from the Baskahegan survey (Kleinschmidt 2012b) concerning scenic impact and continued use. However, it is unclear how these are connected to Criterion C which concerns viewer expectations.

**D. Purpose and Context of the Proposed Activity.** This criterion is not discussed, though a Low rating is shown in Table 2 Summary of Statutory Criteria’s Effect on Scenic Impact (VIA p. 105). The possible meaning of this criterion is discussed under Bottle Lake’s Criterion D (page 16 of this review).

**E.1 Extent, Nature and Duration.** The VIA states that “according to the Bowers Survey, the most popular activities are fishing (100%), motor boating (85%), relaxing (81%), observing wildlife (81%), and enjoying/viewing the scenery (81%)” (VIA p. 69) It is odd that the VIA does not provide the percentages of respondents engaging in these activities; I have added them from survey report (Kleinschmidt 2012a). More than half of the respondents also engaged in other activities. This range clearly indicates a wider range of activities than was assumed for SRSNS for which a survey was not conducted.

<sup>14</sup> <http://www.farmauctionguide.com/cgi-bin/guide.cgi?sec=v&type=l&loc=ME&by=state&anum=1276939718>

<sup>15</sup> This result is calculated for Junior Lake from the raw survey data provided by Stantec (2012).

<sup>16</sup> This result is calculated from the raw survey data provided by Stantec (2012). It is for respondents from all three lakes because the number of people primarily fishing on any one lake is so small.

The VIA reports that “Bowers Survey recorded an average of approximately 7 boats and 3 people on shore during a half-day period,” but there is no effort to estimate extent of use based on a common measure (e.g., user days), or duration of use (VIA p. 69).

Since there is an actual survey of Junior Lake users, it is unclear why there is any reference to the Baskahegan Lake survey, which only asked about primary activity.

**E.2 Effect on Continued Use and Enjoyment.** Junior Lake was one of the SRSNS in the Bowers intercept survey. The VIA notes that “60% said the Project would adversely affect their use and enjoyment” and attempts to explain away this result with the assertion that “there is likely some bias reflected in the survey responses due to significant public opposition and outreach by PPDLWs” (VIA p. 70). It is not clear what “bias” means in this context. Normally, when used in conjunction with a probability sample survey, “bias” means that the respondents are not statistically representative of the target population—in this case users of Junior Lake. It may be possible that the opposition learned of the dates and times particular SRSNS would be surveyed and “packed” the users with sympathizers; this would contaminate the survey results and make them meaningless. However, this seems unlikely since no users were observed on Shaw Lake, which was of particular concern to LURC during the first Bowers’ application, and the other lakes seemed to have generally low use, which one would not expect if they were packed with PPDLW members. Further the Bowers Survey (Kleinschmidt 2012a) appears to have been conducted using best professional practices; there is no obvious reason to believe that is seriously biased in the sense it is used in connection to a probability sample survey.

On the other hand, “bias” can also mean “an inclination of temperament or outlook to present or hold a partial perspective at the expense of (possibly equally valid) alternatives.”<sup>17</sup> In this sense there is no challenge to whether the Bowers Survey is representative of actual users of Junior, Pleasant and Sysladobsis Lakes. Rather “bias” becomes a way to indicate dissatisfaction with the way people think or feel. These thoughts or feelings may be the result of PPDLW’s outreach, but they are held by the population of concern identified by the WEA. It is not immediately clear why PPDLW’s efforts are any more bias than FirstWind’s efforts to present the Bowers Wind project in a positive light. There may be room to debate the factually validity of the positions taken by PPDLW and FirstWind, and as a result whether the thoughts and feelings of users are based on the “truth.” However, it is not apparent how this is relevant. The situation is analogous to whether we would consider discarding election results because voters held a partial perspective (i.e. were “biased”).

The VIA interjects that “the 2010 and 2012 Baskahegan surveys ... provide strong evidence that the impact of visibility will not adversely affect scenic quality and recreational uses” (VIA p. 70). I agree that the Baskahegan surveys demonstrate that users on this lake show little concern for the scenic effects of the Stetson Wind Project. However, this survey has its own shortcomings (see page 13 of this review). In any case, the WEA makes it clear that it is the users of Junior Lake that are to be considered, not some other lake.

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<sup>17</sup> <http://en.wikipedia.org/wiki/Bias>

The VIA also states “the Bowers Survey found that 74% of respondents stated that simulated conditions (depicting the proposed wind project) would have no effect on their decision to visit in the future or their likelihood to return” (VIA p. 70). A possible problem with this questions has been discussed in this review (p. 12). Users who intended to continue their use of Junior Lake if the project were constructed could have been confused about whether to provide a neutral or positive response. However, even if this is so it is appropriate to state the effect on continued use for 74% of respondents would be neutral or positive. This figure is on the low side, but comparable to the responses to the other intercept surveys conducted in Maine (Boyle 2012, page 12, Table 3).

The VIA concludes that “based on all of these factors, the effect on continued use and enjoyment of the scenic resource is LOW” (VIA p. 70). While no procedural thresholds for the ratings are provided, it seems a stretch to give a Low impact rating when 60% of users interviewed on Junior Lake indicate that if constructed the Bowers Wind Project would have a negative impact on their enjoyment, and 24% indicate that it would have a negative effect on their continued use.

**F. Scope and Scale of Visibility.** The VIA identifies that up to 13 turbine hubs may be visible, with potential visibility of 10 turbines over much of the lake. Overall 87% of the lake has potential views of turbine hubs. The turbines visible from two viewpoints are represented as occupying view angles of 17° and 13°. The photosimulation in Exhibit 13 shows the Bowers Mountain ridgeline with 10 turbine hubs that are seen from one of the closer locations with high potential visibility. Clearing from the crane paths and turbine pads will be apparent as breaks in the tree line along the ridge. While more turbines will be visible to the south, they will also be further away from the viewer.

The VIA asserts that “as a result of this vastness, the nature of the topography and the distance from the turbines, the landscape is capable of visually absorbing the views of the proposed Project” (VIA p. 71). An inspection of Exhibit 13 Visual Simulation from Junior Lake, Lakeville shows that this assertion is not true—the turbines will be visually the highest elements in the landscape, and clearly visible from much of the lake. The applicability of visual absorption capability to the Bowers Wind Project is discussed further on pages 6-7 of this review.

The lack of support for the claim that the turbines represent a “harmonious layout” is discussed in Bottle Lake’s Criterion F (page 17 of this review).

Nighttime visibility of the FAA warning lights is not discussed, though Exhibits 9 and 10.3 indicate they will be visible.

**G. Overall Scenic Impact.** The VIA presents a rationale for the reasons why it thinks that the overall impact will be Medium, however the stated facts may not be accurate. For instance, the VIA states that “with regard to the scenic criteria in the *Evaluation*... it’s scenic values are diminished by ... the presence of inharmonious development” (VIA p. 74). Yet the table that presents the *Evaluation* ratings (VIA p. 67) indicates that Junior Lake did not receive a reduction in points for Inharmonious Development. Another example: “The visibility of the project is not so extensive and dominant as to deter the typical user, and will not substantively reduce use and enjoyment” (VIA p. 74). Yet the Bowers survey found that among the actual users of Junior

Lake who were sampled, 60% indicate that if constructed the Bowers Wind Project would have a negative impact on their enjoyment, and 24% indicate that it would have a negative effect on their continued use. On the face of it, these figures suggest that a substantial number of users will be deterred and experience reduced enjoyment.

No procedure for combining the evaluation criteria into an overall evaluation is presented. In particular, there is no rationale for distinguishing the threshold between Adverse and Unreasonably Adverse scenic impacts. This concern is discussed further in Bottle Lake's section G (page 18 of this review).

#### 2.7.4 Keg Lake

**A. Significance.** Keg Lake is listed as a Great Pond with a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine's Unorganized Towns* (Jones 1986).

A "Significant" scenic lake would fall to the level of being not significant if its rating were below 20 points. Therefore Keg Lake's status would have been safe if the project had been in operation at the time of the *Evaluation*, since the maximum number of points that could be subtracted for the potentially inharmonious wind turbine visibility would be 10—the additional 10 points appear to be reserved for drastic fluctuations in water level (Jones 1986, page 13).

Scenic Attributes	Rating for Keg Lake
Relief (30)	Low (10)
Physical features (25)	Med (15)
Shore configuration (15)	Low (5)
Vegetation diversity (15)	None (0)
Special features (15)	None (0)
Inharmonious development (-20)	Lo/N (0)
Total (100)	30

The VIA also indicates that Keg Lake has been assigned a Management Class of 7 by LURC. While this may be useful contextual information, it is not revealed how this is directly relevant to the Wind Energy Act's first Evaluation Criterion.

**B. Existing Character of the Surrounding Area.** The lake's location, size (371 acres), land cover (mixed forest), topography (low-lying hills), and distance to the nearest proposed turbines (3.7 miles) are stated. There are approximately 15 camps along the most western shore. I found the aerial photo of the lake with cultural features indicated to be very informative.

See Bottle Lake's Criterion B for a discussion of alternative ways that Existing Character of the Surrounding Area might be interpreted (page 16 of this review).

**C. Typical Viewer Expectations.** There is no user survey data for Keg Lake. This section identifies recreation uses, but does not discuss typical viewer expectations. The VIA asserts that “it cannot be assumed that their expectations for a pristine environment are high” (VIA p. 76). While I agree that Keg Lake is not pristine (i.e., untouched by people), I can fully imagine (but do not know for sure) people coming to their camp on Keg Lake and talking to a neighbor about how good it is to get away to the unspoiled natural conditions at Keg Lake. This issue is also discussed under Bottle Lake’s Criterion C (page 16 of this review).

**D. Purpose and Context of the Proposed Activity.** This criterion is not discussed, though a Low rating is shown in Table 2 Summary of Statutory Criteria’s Effect on Scenic Impact (VIA p. 105). The possible meaning of this criterion is discussed under Bottle Lake’s Criterion D (page 16 of this review).

**E.1 Extent, Nature and Duration.** There are no studies of recreation use of Keg Lake. Common uses are asserted to be boating, fishing, paddling and snowmobiling, but not swimming. There is no public boat launch. This lake is identified as having 15 structures, which may well generate seasonal use. For instance, it may not be a fishing destination, but there may be quite a few people pan fishing. It is simply unknown.

Nighttime use is not discussed. This issue is discussed further under Bottle Lake’s Criterion E.1 (page 17 of this review).

**E.2 Effect on Continued Use and Enjoyment.** There are no studies of how additional development, including wind energy, would affect user enjoyment and continued use of Keg Lake. However, the VIA asserts “the common activity is likely fishing and some paddling, primarily by camp owners. As such, they are still likely to continue to visit and use the resource” (VIA p. 77). This may be so, but no specific evidence is cited for this assertion about scenery being unimportant to people engaged in these activities.

**F. Scope and Scale of Visibility.** The VIA identifies that up to 12 turbine hubs may be visible, primarily from the western portion of the lake. Along the northern side and south end of the lake, no turbines are visible. The photosimulation in Exhibit 14 shows the ridges of Bowers Hill and 10 turbine hubs are clearly visible, with several blade tips popping up to the left. The visual effects of the clearing for crane paths and turbine pads are clearly visible. The resolution of the image and the lighting conditions in this simulation make it difficult to see details that might be visible under better viewing conditions. Nonetheless, the turbines in the photosimulation occupy a horizontal angle 15° and Exhibit 14 makes it clear that they will have a significant visual presence.

The lack of support for the claim that the turbines represent a “harmonious layout” is discussed in Bottle Lake’s Criterion F (page 17 of this review).

Nighttime visibility of the FAA warning lights is not discussed, though Exhibits 9 and 10.4 indicate they will be visible.

**G. Overall Scenic Impact.** The VIA presents a clear rationale for the reasons why LandWorks thinks that the overall impact will be Low-Medium. However, the VIA states that “The Bowers Wind Project will not have an adverse, unreasonable effect on scenic values and existing uses of Keg Lake” (VIA p. 79). The evidence it then presents concerns limited access, lack of a boat launch, that it is not well-known, and the primary users will be camp owners. None of these facts concerns “scenic values and existing uses.”

No procedure for combining the evaluation criteria into an overall evaluation is presented. This concern is discussed in Bottle Lake’s section G (page 18 of this review).

### 2.7.5 Pleasant Lake

**A. Significance.** Pleasant Lake is listed as a Great Pond with an outstanding scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine’s Unorganized Towns* (Jones 1986).

An Outstanding scenic lake is one with 50 or more points. If the project had been in operation at the time of the *Evaluation* and the turbines were considered “Inharmonious Development,” the effect would be to demote Pleasant Lake to a “Significant” scenic lake.

The VIA also indicates that Pleasant Lake has been assigned a Management Class of 2 for high value, accessible undeveloped lake by LURC. While this may be useful contextual information, it is not revealed how this is directly relevant to the Wind Energy Act’s first Evaluation Criterion.

Scenic Attributes	Rating for Pleasant Lake
Relief (30)	10
Physical features (25)	15
Shore configuration (15)	5
Vegetation diversity (15)	10
Special features (15)	10
Inharmonious development (-20)	0
Total (100)	50

**B. Existing Character of the Surrounding Area.** The lake’s location, size (1,550 acres), land cover (mixed forest), topography (low rolling hills), and distance to the nearest proposed turbines (2.4 miles) are stated. Most of the shoreline is undeveloped; Maine Wilderness Camps is located on the northeastern shore and a few camps are clustered on the southeastern shore. The area has a substantial amount of harvesting activity, including some visible on nearby Bowers Mountain. I found the aerial photo of the lake with cultural features indicated to be very informative.

See Bottle Lake’s Criterion B for a discussion of alternative ways that Existing Character of the Surrounding Area might be interpreted (page 16 of this review).

**C. Typical Viewer Expectations.** Pleasant Lake is one of the SRSNS where users were surveyed (Kleinschmidt 2012a). The VIA states that “evidence suggests that viewer expectations could be lower based on the most common recreational activities on the lake (i.e. fishing and boating)” (VIA p. 81). However, the survey results for Pleasant Lake indicate that everyone expected they would have a positive experience and 71 percent expected their experience would be of “very high quality.”<sup>18</sup> In addition, it appears that scenery may be part of the experience of people who are primarily fishing. Eighty-two percent of those who indicated “fishing from a boat or shore” was their primary activity also indicated that they engaged in “viewing scenery.”<sup>19</sup> There are too few respondents who were primarily boating to calculate the role of viewing scenery for that group.

**D. Purpose and Context of the Proposed Activity.** This criterion is not discussed, though a Low rating is shown in Table 2 Summary of Statutory Criteria’s Effect on Scenic Impact (VIA p. 105). The possible meaning of this criterion is discussed under Bottle Lake’s Criterion D (page 16 of this review).

**E.1 Extent, Nature and Duration.** The VIA states that “according to the Bowers Survey, the most popular activities are relaxing (100%), observing wildlife (97%), enjoying/viewing the scenery (97%), and camping (94%)” (VIA p. 81) It is odd that the VIA does not provide the percentages of respondents engaging in these activities; I have added them from survey report (Kleinschmidt 2012a). More than half of the respondents also engaged in other activities. This range clearly indicates a wider range of activities than was assumed for SRSNS for which a survey was not conducted.

The VIA reports that “Bowers Survey recorded an average of approximately 6 boats and 29 people on shore during a half-day period,” but there is no effort to estimate extent of use based on a common measure (e.g., user days), or duration of use (VIA p. 81).

**E.2 Effect on Continued Use and Enjoyment.** The VIA notes that the Bowers survey found if the project were constructed, 70% of respondents anticipated it would have a positive or neutral effect on their enjoyment and 86% indicated that it would have a positive or neutral effect on their continued use. Said another way, 30% indicated it would have a negative effect on enjoyment and 14% that it would have a negative effect on their continued use.

The VIA states that “fishing is the primary use, which is an activity where there is evidence that people do not place as high a value on scenic quality with regard to their overall enjoyment” (VIA p. 81). However, the Bowers survey found that relaxing was the most common activity (42% compared to 29% for fishing) and people may be more prone to meditating on the scenery if they are relaxing (or maybe not). In any case no evidence is cited to support the assertion that scenery is not important to people who are fishing.

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<sup>18</sup> This result is calculated for Junior Lake from the raw survey data provided by Stantec (2012).

<sup>19</sup> This result is calculated from the raw survey data provided by Stantec (2012). It is for respondents from all three lakes because the number of people primarily fishing on any one lake is so small.

The VIA concludes that “Based on all of these factors, the effect on continued use and enjoyment of the scenic resource is LOW” (VIA p. 81). This may be so, but there is no rationale presented why a negative effect to the enjoyment of 30% and continued use of 14% of users is still within the threshold of a Low rating.

**F. Scope and Scale of Visibility.** The VIA identifies that 16 turbine hubs may be visible at a distance less than 5 miles for a large part of the lake.

The photosimulation in Exhibit 15 shows the ridges of Bowers Mountain and Dill Hill with 14 turbine hubs and two blades that are seen from the boat launch at the southern end of the lake. The visible turbines span a 30° and are 5.1 to 6.6 miles distant.

Exhibit 16 represents a view from near the northern shore, where 11 turbine hubs are visible on Bowers Mountain with blade tip on the left side and another possible hub off the right side of the photosimulation. From this viewpoint the visible turbines span a 45° arc and are 2.8 to 4.3 miles distant. The VIA states that “from this location [Exhibit 16: Visual Simulation from Pleasant Lake, West]... the angle of view decreases to just 8° or 2.2% of the 360° view in some spots (see Diagram 12)” (VIA pp. 82-83). This statement is in error because the viewpoint in Diagram 12 is not the same as the viewpoint in Exhibit 16, as can be clearly seen by looking at the maps. In addition, the angle described in Diagram 12 only encompasses 6 turbines, not the 13 turbines visible in part from Exhibit 16’s viewpoint.

The VIA asserts that “although the turbines are visible throughout much of the lake, they would not be an unduly dominant visual presence” (VIA p. 83). It is unclear how this conclusion is reached, since not threshold is provided for identifying when wind turbines might individually or collectively become dominant. However, the VIA states that “the central angle of view occurs within 40-60 degrees and is the area that most highly influences human perception of a scene, given a fixed viewing direction. The simulations prepared for this report depict this central angle of view” (VIA p. 38-39). In the absence of a threshold to discuss, I would only say that the 30° and 45° angle of view for the visible turbines in Exhibits 15 and 16 respectively represent a very large proportion of the “central angle of view... that most highly influences human perception of a scene.” If a user is facing northward on the lake, toward the highest topography surrounding the lake, they will see these views.

The lack of support for the claim that the turbines represent a “harmonious layout” is discussed in Bottle Lake’s Criterion F (page 17 of this review).

Nighttime visibility of the FAA warning lights is not discussed, though Exhibits 9 and 10.5 indicate they will be visible.

The rating for Criterion F is Medium. I am not saying this is wrong; just that the turbines appear to have a significant visual presence to me and no reliable procedure is presented to determine if this presence represents a Low, Medium or High contribution to the overall scenic impact.

**G. Overall Scenic Impact.** The VIA identifies “West Musquash Lake [as]... another lake that is rated ‘Outstanding’ for its scenic quality within 8 miles of the Project...and offering an

alternative experience to the recreation user” (VIA p. 83). I believe that this line of thinking is an important part of the Overall Scenic Impact for the project that falls under Criterion B Existing Character of the Surrounding Area. If there are reasonable alternative SRSNS for displaced users within a reasonable distance (i.e., the region), then this might lessen the Overall scenic impact. At the very least, this procedure would require a systematic evaluation of the WEA evaluation criteria. If this interpretation is being used, then a procedure to conduct this evaluation needs to be explicitly stated; if not then the discussion of West Musquash Lake is irrelevant in this context.

The VIA asserts that “logging activity...directly influences user expectations by diminishing the potential for this area and the lake itself to be viewed as a pristine, unaffected landscape” (VIA p. 84). While I agree with the observation that there is logging activity in the area and therefore the landscape is not a pristine forest, no support is given that this is how SRSNS users experience this environment. This issue was discussed for Bottle Lake under Criterion C (see page 17 of this review).

The VIA states that “given the extent of the turbine array and its distance, the nature of that visibility will not be overwhelming or inescapable” (VIA p. 84). Must the scenic impact reach “overwhelming or inescapable” to be determined Unreasonably Adverse? What is the justification of this threshold? Do visual angles of 30° to 45° for the project in the context of the 40° to 60° “that most highly influences human perception of a scene” reach the level of “overwhelming” for users moving northward looking at the highest topography surrounding the lake? I am not taking a position on whether it is or not; I am saying that the visual presence of the turbines is sufficient to raise the question and there is no reliable procedure to determine an answer.

#### **2.7.6 Pug Lake**

**A. Significance.** Pug Lake (aka Pig Lake) is a nearly enclosed bay that is considered part of West Grand Lake, which is listed as a Great Pond with an outstanding scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine’s Unorganized Towns* (Jones 1986).

Pug Lake is the only portion of West Grand Lake that is within 8 miles of the Bowers Wind Project generation facilities. The VIA asserts that it is unlikely that if Pug Lake were considered by itself, it would not have reached the threshold of a “Significant” scenic resource in the *Evaluation*, because “the configuration of the lake itself is ordinary and the vegetation is typical of the region” (VIA p. 85). No other evidence (i.e., photos, an analysis) is given to support this assertion, but it does seem likely.

An “Outstanding” scenic lake would fall to the level of being not significant if its rating were below 50 points. Therefore West Grand Lake’s status would have been safe if the project had been in operation at the time of the *Evaluation*, since the maximum number of points that could be subtracted for additional potentially inharmonious wind turbine visibility would be 5—the additional 10 points appear to be reserved for drastic fluctuations in water level (Jones 1986, page 13).

Scenic Attributes	Rating for W. Grand Lk.
Relief (30)	Low (10)
Physical features (25)	High (25)
Shore configuration (15)	High (15)
Vegetation diversity (15)	Med (10)
Special features (15)	Med (10)
Inharmonious development (-20)	Med (-5)
Total (100)	65

The VIA also indicates that Pug Lake has been assigned a Management Class of 3 (potentially suitable for development) by LURC. While this may be useful contextual information, it is not revealed how this is directly relevant to the Wind Energy Act's first Evaluation Criterion.

**B. Existing Character of the Surrounding Area.** The lake's size, land cover, and topography are not presented. The distance to the nearest proposed turbines is 7.7 miles. This portion of the lake is surrounded by the Sunrise Conservation Easement, which maintains a working forest and restricts future development. I found the aerial photo of the lake with cultural features indicated to be very informative.

See Bottle Lake's Criterion B for a discussion of alternative ways that Existing Character of the Surrounding Area might be interpreted (page 16 of this review).

**C. Typical Viewer Expectations.** There is no user survey data for Pug Lake. This section describes Pug Lake as an out of the way corner of West Grand Lake, which is a notable destination, but does not discuss typical viewer expectations.

**D. Purpose and Context of the Proposed Activity.** This criterion is not discussed, though a Low rating is shown in Table 2 Summary of Statutory Criteria's Effect on Scenic Impact (VIA p. 105). The possible meaning of this criterion is discussed under Bottle Lake's Criterion D (page 16 of this review).

**E.1 Extent, Nature and Duration.** There are no studies of recreation use of Pug Lake. There is a public boat launch and primitive campsite. It is suggested that camping, fishing and snowmobiling are common uses. It is anticipated that most of the use is from people in transit to or from the main portion of West Grand Lake.

Nighttime use is not discussed. This issue is discussed further under Bottle Lake's Criterion E.1 (page 17 of this review).

**E.2 Effect on Continued Use and Enjoyment.** There are no studies of how additional development, including wind energy, would affect user enjoyment and continued use of Pug Lake. However, the VIA asserts that "the effect on continued use and enjoyment is LOW" because it "would not be a place where one stays to enjoy the scenery. Even if fisherman do stay for longer periods, they are most likely nearer to the shoreline, where there is no Project

visibility” (VIA p. 87). This may be so, but it described the existing use pattern (i.e., Criterion E.1) and does not address enjoyment or continued use.

**F. Scope and Scale of Visibility.** The VIA identifies that up to 6 turbines may be visible. The photosimulation in Exhibit 17 shows a couple of blade tips. The turbines in the photosimulation occupy a horizontal angle 5° and Exhibit 14 makes it clear that they will have a significant visual presence.

The photography used for Exhibit 17 was taken with a modest telephoto lens, which means that the simulation should be viewed from further away than the other photosimulation. Without knowing this, the casual viewer would think the visual magnitude of the turbines will be greater than they will actually be (see page 10-11 of this review).

Nighttime visibility of the FAA warning lights is not discussed, though Exhibits 9 and 10.7 indicate they will be visible.

**G. Overall Scenic Impact.** The VIA presents a rationale for the reasons why it thinks that the overall impact will be Low. The logic rest on the great distance to the nearest turbine—7.7 miles is nearly to the point where the WEA determines that scenic impacts are insignificant.<sup>20</sup> In addition, shoreline vegetation is likely to screen almost all views of the turbine.

### 2.7.7 Scraggly Lake

**A. Significance.** Scraggly Lake is listed as a Great Pond with a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine’s Unorganized Towns* (Jones 1986).

A “Significant” scenic lake would fall to the level of being not significant if its rating were below 20 points. Therefore Scraggly Lake’s status would have been safe if the project had been in operation at the time of the *Evaluation*, since the maximum number of points that could be subtracted for the potentially inharmonious wind turbine visibility would be 10—the additional 10 points appear to be reserved for drastic fluctuations in water level (Jones 1986, page 13).

Scenic Attributes	Rating for Scraggly Lake
Relief (30)	Low (10)
Physical features (25)	Low (10)
Shore configuration (15)	Med (10)
Vegetation diversity (15)	High (15)
Special features (15)	None (0)
Inharmonious development (-20)	Lo/N (0)

<sup>20</sup> 35-A M RSA, § 3452, sub-§3

Total (100)	45
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The VIA also indicates that Junior Lake has been assigned a Management Class of 7 by LURC. While this may be useful contextual information, it is not revealed how this is directly relevant to the Wind Energy Act's first Evaluation Criterion.

**B. Existing Character of the Surrounding Area.** The lake's location, size (1,641 acres), land cover (mixed forest), topography (low rolling hills), and distance to the nearest proposed turbines (4.1 miles) are stated. There are perhaps half a dozen camps or residences scattered around the lake. Poor access and a lack of development may give the lake a feeling of relative remoteness. Evidence of harvesting activity is visible on Bowers Mountain. I found the aerial photo of the lake with cultural features indicated to be very informative.

See Bottle Lake's Criterion B for a discussion of alternative ways that Existing Character of the Surrounding Area might be interpreted (page 16 of this review).

**C. Typical Viewer Expectations.** Scraggly Lake is one of the SRSNS where users were surveyed (Kleinschmidt 2012a). The VIA states that "evidence suggests that viewer expectations could be lower based on the most common recreational activities on the lake (i.e. fishing and boating)" (VIA p. 90-91). However, the survey results for Scraggly Lake indicate that everyone expected they would have a positive experience and 77 percent expected their experience would be of "very high quality."<sup>21</sup> In addition, it appears that scenery may be part of the experience of people who are primarily fishing. Every interviewed user, including those who were there primarily to fish, indicated that they engaged in "viewing scenery."<sup>22</sup>

The Baskahegan Lake survey makes an important general contribution to our understanding of the perception of grid-scale wind energy projects. However the use and experience of Scraggly and Baskahegan Lake may be quite different, if for no other reason than Baskahegan Lake is much more accessible, and is not a SRSNS.

**D. Purpose and Context of the Proposed Activity.** This criterion is not discussed, though a Low rating is shown in Table 2 Summary of Statutory Criteria's Effect on Scenic Impact (VIA p. 105). The possible meaning of this criterion is discussed under Bottle Lake's Criterion D (page 16 of this review).

**E.1 Extent, Nature and Duration.** The VIA states that "according to the Bowers Survey, the most popular activities are observing wildlife (100%), enjoying/viewing the scenery (100%), camping (85%) and fishing (85%)" (VIA p. 91) It is odd that the VIA completely misses relaxing (93%) and does not provide the percentages of respondents engaging in these activities; I have added them from survey report (Kleinschmidt 2012a). More than half of the respondents also

<sup>21</sup> This result is calculated for Junior Lake from the raw survey data provided by Stantec (2012).

<sup>22</sup> This result is calculated from the raw survey data provided by Stantec (2012). It is for respondents from all three lakes because the number of people primarily fishing on any one lake is so small.

engaged in other activities. This range clearly indicates a wider range of activities than was assumed for SRSNS for which a survey was not conducted.

The VIA reports that “Bowers Survey recorded an average of approximately 3 boats and 5 people on shore during a half-day period,” but there is no effort to estimate extent of use based on a common measure (e.g., user days), or duration of use (VIA p. 91).

**E.2 Effect on Continued Use and Enjoyment.** The VIA notes that the Bowers survey found if the project were constructed, 50% of respondents anticipated it would have a positive or neutral effect on their enjoyment and 77% indicated that it would have a positive or neutral effect on their continued use. Said another way, 50% indicated it would have a negative effect on enjoyment and 23% that it would have a negative effect on their continued use.

The VIA concludes that “based on all of these factors, the effect on continued use and enjoyment of the scenic resource is LOW” (VIA p. 92). This may be so, but there is no rationale presented why a negative effect to the enjoyment of 50% and continued use of 23% of users is still within the threshold of a Low rating.

**F. Scope and Scale of Visibility.** The VIA identifies that up to 16 turbines may be visible. Visibility is greatest along the southern shore, but only areas near the northern shore will be free of views of some turbines. The photosimulation in shows the turbines on Bowers Mountain from the boat launch. The turbines extend across an arc of 36° from the Exhibit 18 viewpoint; with the closest turbine being 5.3 miles distant. The VIA states that “at a closer location on the lake, the angle of view still occupies a limited human field of vision – 43.23°” (VIA P. 92). It is unclear how an arc of 36° or 43° is considered to occupy a limited area in the 40-60 degrees that compose our central angle of view. Refer to the discussion of Pleasant Lake’s Criterion F for more details (page 30 of this review).

The lack of support for the claim that the turbines represent a “harmonious layout” is discussed in Bottle Lake’s Criterion F (page 17 of this review).

Nighttime visibility of the FAA warning lights is not discussed, though Exhibits 9 and 10.8 indicate they will be visible.

**G. Overall Scenic Impact.** The VIA presents a rationale for why it thinks that the overall impact will be Medium. However, the assertions are not always clear. For instance, the VIA states “it can also be posited that the extent of the project and linear layout reduces the potential for the view of the project to act as a distinct focal point that will continually draw the eye” (VIA p. 94-95). What does this statement mean in the context of the Exhibit 18 photosimulation? Is the assertion that the line of turbines is so extends across such a wide arc that it cannot serve as a focal point?

The VIA states that “visibility is also qualified by the habits of the users... paddlers tend to hug shorelines” (VIA p. 95). What is unknown is whether they hug the southern shoreline where visibility is higher, or the northern shoreline where visibility is lower. The Bowers survey had users sketch a map of where they spent time on the lake. While these data are not analyzed, they

addressed an important question: Are users found mostly in parts of the lake with high visibility or low visibility? Perhaps such an analysis should have been presented under Criterion E.1.

No procedure for combining the evaluation criteria into an overall evaluation is presented. This concern is discussed in Bottle Lake's section G (page 18 of this review).

### 2.7.8 Shaw Lake

**A. Significance.** Shaw Lake is listed as a Great Pond with a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine's Unorganized Towns* (Jones 1986).

A "Significant" scenic lake would fall to the level of being not significant if its rating were below 20 points. Therefore Shaw Lake's status would have been safe if the project had been in operation at the time of the *Evaluation*, since the maximum number of points that could be subtracted for the potentially inharmonious wind turbine visibility would be 10—the additional 10 points appear to be reserved for drastic fluctuations in water level (Jones 1986, page 13).

Scenic Attributes	Rating for Shaw Lake
Relief (30)	Low (10)
Physical features (25)	Med (15)
Shore configuration (15)	Low (5)
Vegetation diversity (15)	Med (10)
Special features (15)	None (0)
Inharmonious development (-20)	Lo/N (0)
Total (100)	40

The VIA also indicates that Shaw Lake has been assigned a Management Class of 7 by LURC. While this may be useful contextual information, it is not revealed how this is directly relevant to the Wind Energy Act's first Evaluation Criterion.

**B. Existing Character of the Surrounding Area.** The lake's location, size (251 acres), land cover (mixed forest), topography (low rolling hills), and distance to the nearest proposed turbines (3.5 miles) are stated. Shaw Lake may seem like a SRSNS of contrasts. There is no road access to the lake shore and three-quarters of the lake is surrounded by the Sunrise Conservation Easement. On the other hand, the 66-lot Vinegar Hill Subdivision is located just to the north. Views of Bowers Mountain and a portion of Dill Ridge are blocked by intervening topography, though the turbines will be visible. I found the aerial photo of the lake with cultural features indicated to be very informative.

See Bottle Lake's Criterion B for a discussion of alternative ways that Existing Character of the Surrounding Area might be interpreted (page 16 of this review).

**C. Typical Viewer Expectations.** There is no user survey data for Shaw Lake. This section identifies discusses low use and difficult access, and concludes that this will “create a feeling of remoteness... but this is tempered somewhat by the viewer’s awareness that the lake is located in a working landscape with logging activity and neighbors a large subdivision with high density build-out” (VIA P. 97). It is unclear to me why a feeling of remoteness is incompatible with distant visual signs of logging activity and even residences. There is no attempt to describe the relationship between a feeling of remoteness and scenic quality or impacts.

**D. Purpose and Context of the Proposed Activity.** This criterion is not discussed, though a Low rating is shown in Table 2 Summary of Statutory Criteria’s Effect on Scenic Impact (VIA p. 105). The possible meaning of this criterion is discussed under Bottle Lake’s Criterion D (page 16 of this review).

**E.1 Extent, Nature and Duration.** While the intention was to survey uses of Shaw Lake, none were encountered after two 6-hour periods (Kleinschmidt 2012a, p. 15). I agree that given this situation, it was reasonable to discontinue efforts to survey users of Shaw Lake. However, it is worth noting that in the Baskahegan survey respondents were asked if they had visited Shaw Lake and 15% (n=4) indicated that they had. This number compares to 58% having visited Pleasant Lake, 33% Scraggly Lake and 26% Junior Lake ((Kleinschmidt 2012b, p. 16). Of course this is not an indication of the frequency of visits, but it is an indication that Shaw Lake may receive some use.

**E.2 Effect on Continued Use and Enjoyment.** No users were encountered on Shaw Lake to interview. The VIA states “just because use is extremely low, it does not automatically translate into a remote and pristine lake that would be negatively impacted” (VIA p. 97). I would concur with this observation in general, but would also observe that the VIA asserts that “the difficulty in accessing the lake and limited development along the shoreline does create a feeling of remoteness” (VIA p. 97). It is asserted that the 66-lot subdivision would “temper” or “preclude” this remoteness, but no data or analysis are presented to support this (e.g., photographs of the subdivision from the lake).

There is no discussion of “the potential effect of the generating facilities’ presence on the public’s continued use and enjoyment” of Shaw Lake.<sup>23</sup>

**F. Scope and Scale of Visibility.** The VIA identifies that up to 14 turbine hubs may be visible. Visibility is greatest along the southern shore, but only areas near the northern shore will be free of views of some turbines. The photosimulation in Exhibit 19 shows 13 turbines; mostly hubs and blades that span an arc of 45° and are as close as 4.1 miles.

The lack of support for the claim that the turbines represent a “harmonious layout” is discussed in Bottle Lake’s Criterion F (page 17 of this review).

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<sup>23</sup> 35-A MRSA, § 3452, sub-§3(E)

Nighttime visibility of the FAA warning lights is not discussed, though Exhibits 9 and 10.8 indicates they will be visible.

**G. Overall Scenic Impact.** The VIA presents a rationale for why it thinks that the overall impact will be Low-Medium. It is stressed that LURC has not designated Shaw Lake as “remote.” The VIA asserts that “the project will not appear overly dominant” in part because “the regular pattern and linear nature of the array reflects accepted practice for reducing visual impact by providing order and pattern to the turbine siting” (VIA p. 99). No citations are given supporting this assertion.

The VIA asserts that “the Baskahegan and Bowers project area lakes reinforce the fact that having wind turbines in view does not necessarily diminish the likelihood of users to return to this resource” (VIA p. 99). However the Bowers survey results for Junior, Pleasant and Scraggly Lakes indicated that 60%, 30% and 50% of users respectively would be less likely to continue to use these lakes. How is this conclusion supported by these results?

No procedure for combining the evaluation criteria into an overall evaluation is presented. This concern is discussed in Bottle Lake’s section G (page 18 of this review).

### 2.7.9 Sysladobsis Lake

**A. Significance.** Sysladobsis Lake is listed as a Great Pond with a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine’s Unorganized Towns* (Jones 1986).

A “Significant” scenic lake would fall to the level of being not significant if its rating were below 20 points. Therefore Sysladobsis Lake’s status would have been safe if the project had been in operation at the time of the *Evaluation*, since the maximum number of points that could be subtracted for the potentially inharmonious wind turbine visibility would be 10—the additional 10 points appear to be reserved for drastic fluctuations in water level (Jones 1986, page 13).

Scenic Attributes	Rating for Sysladobsis Lake
Relief (30)	Low (10)
Physical features (25)	Med (15)
Shore configuration (15)	High (15)
Vegetation diversity (15)	Low (5)
Special features (15)	None (0)
Inharmonious development (-20)	Lo/N (0)
Total (100)	45

**B. Existing Character of the Surrounding Area.**

The lake's location, size (5,401 acres, 691 within 8 miles of a proposed turbines), land cover (mixed forest), topography (low-lying hills), and distance to the nearest proposed turbines (6.3 miles) are stated. The shoreline is rocky, but interspersed with sandy beaches. There are several islands. There are approximately 52 camps scattered along the shore within 8 miles of the proposed turbines. I found the aerial photo of the lake with cultural features indicated to be very informative.

See Bottle Lake's Criterion B for a discussion of alternative ways that Existing Character of the Surrounding Area might be interpreted (page 16 of this review).

**C. Typical Viewer Expectations.** There is no user survey data for Sysladobsis Lake. The VIA states that "Sysladobsis is a moderately used lake with a significant amount of development, indicating that scenic expectations of users would not be high," though no evidence for this assertions if given (VIA p. 101). For instance, the *Evaluation* assigned the highest scenic rating in the state to Craig Pond and described it as "partially developed" (Jones 1986, p. 20). Other scenic lakes also seem to have some development, so it is not development *per se* that indicates that scenic quality and possibly expectations would not be high.

The VIA also states that "the lake is commonly used by anglers and boaters as well as campers, whose focus is not typically on scenic quality but quality of the fisheries" (VIA p. 101). Again, no supporting evidence is referenced. The Bowers survey found that 93% of respondents indicated they engaged in "viewing scenery" or "enjoying the scenery/scenic viewing," though it is the primary activity for only 3% of the respondents (Stantec 2012b). Eighty-six percent of the respondents who indicated fishing from a boat was their primary activity also indicated that they enjoyed the scenery.

**D. Purpose and Context of the Proposed Activity.** This criterion is not discussed, though a Low rating is shown in Table 2 Summary of Statutory Criteria's Effect on Scenic Impact (VIA p. 105). The possible meaning of this criterion is discussed under Bottle Lake's Criterion D (page 16 of this review).

**E.1 Extent, Nature and Duration.** There are no studies of recreation use of Sysladobsis Lake. There is a public boat launch and primitive campsite. It is asserted that "fishing, boating, paddling, swimming and camping are common recreational uses." While it is thought that "this lake receives medium to high frequency of use by anglers" no there no evidence is provided for the assertion that "this particular portion of the lake likely sees fewer users and less activity" (VIA p. 101). These assertions may be true, but no rationale supporting them is presented.

Nighttime use is not discussed. This issue is discussed further under Bottle Lake's Criterion E.1 (page 17 of this review).

**E.2 Effect on Continued Use and Enjoyment.** There are no studies of how additional development, including wind energy, would affect user enjoyment and continued use of Sysladobsis Lake.

While the description on why Criterion E.2 is short, it has a different tone and character than found elsewhere.

Our understanding of the nature of the lake's use and subsequent viewer expectations do not suggest that the Project would result in a significant negative impact on use and enjoyment of the lake. In addition, fishing is anticipated to be the primary use and Palmer (1999) found that fishing was an activity where people did not appear to place as high a value on scenic quality as people who hiked or paddled (VIA p. 101).

There are two major improvements. First of all the assumed recreation use is not asserted as a fact, it is described as "our understanding," which is more honest. While this may seem like debating semantics, it is an acknowledgment that they are not certain of the extent, nature and duration of use on the lake. Second there is reference to a study that links recreation activity to sensitivity to scenic impacts. As the author of this study I have cited it often in my reviews, but I would also note that it concerned the perceived scenic impact of clearcutting and the only on-site evaluations were from hikers; additional respondent groups were recruited by other means. The VIA has at its disposal two surveys of lake users that could be analyzed in greater depth to make a better supported evaluation of Criterion E.2. While I do believe that both surveys have their flaws,<sup>24</sup> it seems to me that they are more likely to provide relevant data than the study of clearcutting scenic impacts by Palmer (1999), which I believe should be given secondary attention in this case. As the intercept surveys of wind projects accumulate, it should be possible to conduct a meta-analysis that would provide a combined result that may provide a more important picture of the relationship between recreation activity and the effect of wind energy development on scenic quality, enjoyment and continued use.

**F. Scope and Scale of Visibility.** The VIA identifies that up to 10 turbine hubs may be visible within 8 miles of the viewer; the closest visible turbine will be 6.3 miles distant. From the simulation viewpoint, the visible turbines will span an arc of 10°. The VIA states that "Gettchell Mountain is the proximate landform in view, and it would serve to provide visual balance to the turbines on the adjacent Bowers Mountain (see Exhibit 20: Visual Simulation from Sysladobsis Lake), contributing to the landscape's ability to visually absorb the Project" (VIA p. 102). An inspection of Exhibit 20 Visual Simulation from Sysladobsis Lake, Lakeville shows that this assertion is not true—the turbines will be visually the highest elements in the landscape, and clearly visible from much of the lake. The applicability of visual absorption capability to the Bowers Wind Project is discussed further on pages 6-7 of this review.

The lack of support for the claim that the turbines represent a "harmonious layout" is discussed in Bottle Lake's Criterion F (page 17 of this review).

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<sup>24</sup> I would disclose that it is my belief the exigencies of conducting applied surveys as part of the documentation for obtaining development permits will almost always require compromises resulting in "flaws." It is my responsibility as the scenic expert for the State of Maine to draw attention to these flaws, but this does not mean that the studies are always useless or without merit.

Nighttime visibility of the FAA warning lights is not discussed, though Exhibit 9 and 10.10 indicate they will be visible.

**G. Overall Scenic Impact.** The VIA presents a rationale for the reasons why it thinks that the overall impact will be Low, however the stated facts may not be accurate. For instance, the VIA states that “the lake as a whole is considered to have good fishing and is readily accessible via a number of launches for motorboats, although these are some distance from that portion of the lake within the project area – the closest being over 3 miles” (VIA p. 104). There is a boat launch at the north end of Sysladobsis Lake, well within “that portion of the lake within the project area” that has a hard ramp suitable for trailers.<sup>25</sup>

Concerning the extent of project visibility, the VIA states “the array is clustered in a manner that greatly reduces its visual presence on the lake” (VIA p. 104). However, an inspection of any of the maps shows that the turbines are arrayed roughly in a line at approximately 30° to the line of sight from the lake. In contrast to this, under Criterion F the VIA states that “aside from minor clustering of turbines to the east, the distribution of turbines along the ridge ... does not create a sense of visual clutter” (VIA p. 102). Here it is recognized that the turbines are roughly distributed in a line along the ridge, and that “clustering” may create a “sense of visual clutter.” The important facts are also stated—the closest turbine in the photosimulation is 7.1 miles distant and spans a 10° arc—but it is unclear why the comments about clustering are included.

No procedure for combining the evaluation criteria into an overall evaluation is presented. This concern is discussed in Bottle Lake’s section G (page 18 of this review).

#### **2.7.10 Visual Impact of Associated Facilities**

Associated Facilities including “access and crane-path roads, the express collector line [but not the “mountaintop” collector line between turbines], the substation, the operations and maintenance building (“O&M building”), and the permanent met tower” are considered in pages 121 through 129 of the VIA. Viewshed analyses are conducted for each of these facilities and presented in Exhibit 6 Express Collector Viewshed Map, Exhibit 7 O&M and Substation Viewshed Map, and Exhibit 8 Meteorological Tower Viewshed Map. Each of these analyses considered the screening effect of forest vegetation as well as land form. No viewshed maps are prepared for the access roads, turbine pad clearing, or crane paths.

The express collector line may be visible from a large wedge of Pleasant Lake according to Exhibit 6. However, the express collector line apparently starts near turbine number 8 and heads down the northern side of Bower Mountain. It should hardly be apparent from Pleasant Lake or any of the other SRSNS because it is on the back side of the mountain.

The O&M building will not be visible from any SRSNS, as shown in Exhibit 7.

The meteorological (met) tower is a triangular lattice structure that is approximately 18 inches on a side and 295 feet high. The met tower will be lit with a FAA aviation warning lights that are similar to the lights used on the wind turbines. Exhibit 8 indicates that the single permanent met

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<sup>25</sup> <http://www.maine.gov/doc/parks/programs/boating/sites/310.html>

tower will be visible from large areas of Junior, Pleasant, Shaw and Scraggly Lakes and small portions of Duck and Keg Lakes. Since these areas are all at least 3 miles distant, the tower will not be easily distinguished under most daylight conditions. However, at night the light will be visible from the same lakes as shown in Exhibit 8. The visibility of the temporary met towers is not evaluated; they will be removed during the project's construction.

Although no visibility analysis is prepared for the access roads, turbine pad clearing, and crane paths, the visual simulations do represent their visual effect.

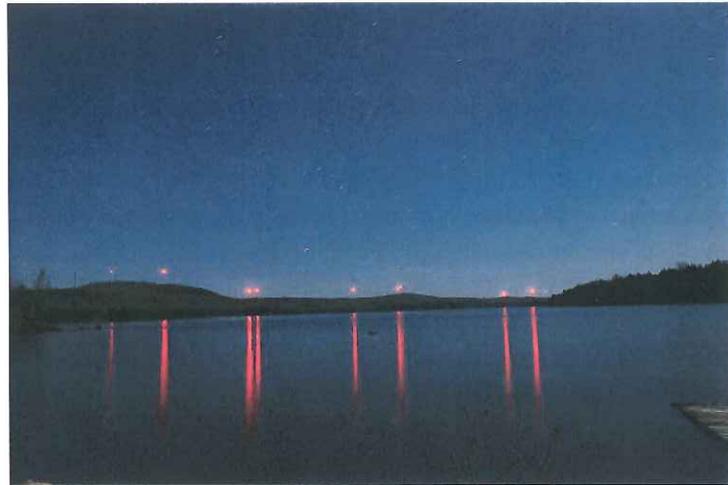
### 2.7.11 Overall Impact Evaluation

In section 4.2.1 Methodology for Evaluating the Statutory Criteria, the VIA describes how each of the evaluation criteria are interpreted and indicators are evaluated to give a rating of Low, Medium or High contribution to the potential scenic impact (VIA p. 29-41). Each SRSNS is evaluated for each criterion; these ratings are summarized in Table 2 (VIA p. 105). In the preceding review of each SRSNS I ask a number of critical questions. It is not that I serious disagreement with the findings summarized in Table 2, though I do have questions about how some of the thresholds between low and Medium or Medium and High were determined. However the most serious issue is that no clear description is provided about how to (1) derive an overall scenic impact rating for each SRSNS, and (2) derive an overall scenic impact rating for the project.

## 2.8 Consideration of Issues of Particular Concern

### 2.8.1 Nighttime Lighting

Lakes create large openings in the forest canopy that make it possible to observe the night sky. Exhibit 9 of the VIA shows the potential visibility of FAA aviation warning lights after accounting for both topographic and vegetative screening; Exhibit 10 shows which turbines in the photosimulations will have FAA aviation warning lights. These all appear accurate, except for Exhibit 10.6 Pleasant Lake West, which seems to have transposed a couple of turbines.



While not a well-studied area of research, there is some evidence that suggests that viewing sunsets and stargazing is important to people (Zube et al. 1984). The Bowers survey found that 76% of respondents reported star gazing/enjoying the night sky (question 5). The VIA states that "The night sky is a cherished resource and the impact cannot be overlooked" (VIA p. 107). This seems to be a potentially important activity that should be clearly incorporated into the evaluation of each SRSNS, not discussed after consideration of the evaluation criteria.

Members of the public in the past have expressed concern about the significant scenic impacts of the FAA aviation warning lights. At the June 2011 hearings for the original Bowers Wind Project, the photo at the right was circulated. This photo is of the Rollins Wind Project looking from the gazebo park in Lincoln, ME over Mattanawcook Pond. At the time I dismissed it as being either an edited photo or an effect resulting from the long exposure time. However I went and checked that night and found it was a very good representation of what I saw; the same phenomenon was apparent the next night too. What is not captured in the photograph is that the lights flash on and off, perhaps 20 times a minute. I returned to Lincoln in December 2012, and saw the same phenomenon, but the next night the pond was frozen and the effect was barely visible. This phenomenon appears to happen when there are ripples on the water that present many continuous reflective surfaces.

I believe that FAA warning lights can pose a serious scenic impact to viewers of the nighttime sky. Of course there needs to be such observers, but the Bowers survey suggests that a large percentage of the respondents do enjoy viewing the nighttime sky. On the other hand there are relatively few users of these SRSNS.

Champlain Wind has committed to installing radar-assisted aviation warning lights once they are approved for use by the FAA. If the project will not be constructed until radar-assisted aviation warning lights are approved, then their use can be considered. However, if the intent is to construct the project with standard aviation warning lights and retrofit the project if and when it is possible in the future, then the scenic impacts of the standard lighting must be evaluated.

### **2.8.2 Mitigation**

It is my understanding the Attorney General advised mitigation not be considered in evaluating scenic impact under the WEA. The instruction was to apply the WEA's evaluation criteria and make a determination. While it may be useful for the public to understand that the Bowers Wind Project has been modified in response to public (and perhaps other) concerns, it is not appropriate to consider it as part of the scenic impact evaluation. This is similar to the problem of how to consider radar-assisted aviation warning lights.

### **2.8.3 Cumulative Impact and Continuous Visibility**

DEP has determined that it "will not be using the document entitled Guidance for Assessing Cumulative Impacts to Protected Natural Resources under the Natural Resources Protection Act to evaluate the Bowers Mountain Wind Power Project. The scenic impacts will be evaluated based on the Wind Energy Act, not on either Chapter 315, Assessing and mitigating impacts to existing scenic and aesthetic uses, or the Site Rules. Any guidance provided in the SOP is not applicable to a wind energy project. To the best of my knowledge, the SOP was never finalized and is not used currently" (Beyer 2013).

However, it may be that cumulative scenic impacts should be considered under Criteria B Existing Character and Surrounding Area, and D Purpose and Context of the Proposed Activity, perhaps with references to Criteria C Expectations, E. Continued Use and Effect on Enjoyment, and F. Scope and Scale. The Office of Energy Independence and Security has released a report on the issues associated with the cumulative visual impacts of wind energy projects (CVIWG 2012).

Exhibit 21 of the VIA shows the location of two existing and two proposed wind projects to the north and west of the greater West Grand Lake area. No scenic resources with visibility of the proposed Bowers Wind Project will be within 8 miles of the other three wind projects. However, the VIA does discuss the potential for users of the scenic lakes to make a multi-day trip on the water and have frequent opportunities for visual exposure to the Bowers Wind Project (i.e., continuous visibility). The VIA presents some data based on boat counts indicating that the number of users making such a trip would be very small, and it is unlikely they would be using canoes or kayaks.

### **2.8.1 Concluding Comment about the Adequacy Review**

LandWorks has prepared a VIA that rests well within the mainstream of current best professional practice. While I may have identified a very few errors, none of them are serious. Frankly, it is in the nature of large technical reports that there will be some errors, so this is neither unusual nor upsetting.

Second, I think that what is needed is a procedure that is based on reliably measured (or described) indicators for each of the Wind Energy Act's Evaluation Criteria; in other words a procedure that is evidence based. The procedure must also systematically combine these indicators to reach a valid determination of whether a project will have a scenic impact that is Not Adverse, Adverse or Unreasonably Adverse. This procedure needs to be sufficiently well defined that any qualified dis-interested person can apply it and reach the same conclusion as any other qualified dis-interested person. The only way I know of to demonstrate the validity of any procedure is to conduct an evaluation of the project after it is built. For instance, this is what currently is happening with the procedures to evaluate impacts from the sound created by grid-scale wind projects at specific sites. Developers are required to conduct post-construction monitoring at regular intervals to verify that their modeled sound effects are accurate, and if the sound impacts reach an Unreasonably Adverse level, then to implement corrective measures. I hope that DEP will consider a similar requirement for monitoring scenic impacts from grid-scale wind energy development.

## 6. References

- Anderson, Lee Roger, Jerry Mosier, and Geoffrey Chandler. April 1979. Visual Absorption Capability. In: Proceedings of Our National Landscape. General Technical Report PSW-35. USDA Forest Service. Berkeley, CA. p. 164-1 71.
- Beard, Frank A., and Robert L. Bradley. 1978. National Register of Historic Preservation Registration Form: Springfield Congregational Church. Augusta, ME: Maine Historic Preservation Commission.
- Boyle, Kevin J. 2012. Assessment of the Kleinschmidt Bowers Mountain Wind-farm and Baskahegan Lake Recreational User Surveys. Newport, VA: Kevin J. Boyle. 21 pp.
- Beyer, Jim R. 2013. DEPLW0613-A2004 and Bowers Wind. Emailed dated February 12, 2013.
- Cohen, Jacob. 1988. Statistical Power Analysis for the Behavioral Sciences. Second edition. New York: Psychology Press.
- Cumulative Visual Impact Study Group. 2012. Report of OEIS Assessment of Cumulative Visual Impacts from Wind Energy Development. <http://maine.gov/energy/pdf/Report%20of%20OEIS%20Assessment%20of%20Cumulative%20Visual%20Impacts%20from%20Wind%20Energy%20Development%20Mar2012.pdf> (Accessed February 21, 2013).
- ESRI. 2010. *ArcGIS Desktop*. Redlands, CA: ESRI.
- Expedited Permitting of Grid-Scale Wind Energy Development*. MRSA Title 35-A, Chapter 34-A. <http://www.mainelegislature.org/legis/statutes/35-A/title35-Ach34-A.pdf> (accessed February 23, 2010).
- Giffen, R. Alec, Drew O. Parkin, and Frederick W. Todd. 1987. *Maine Wildlands Lake Assessment*. Augusta, ME: Maine Department of Conservation, Land Use Regulation Commission. <http://www.maine.gov/doc/mfs/windpower/pubs/pdf/Maine%20Wildlands%20Lake%20Assessment.pdf> (Accessed February 11, 2011).
- Haas, Glenn, Robert Aukerman, Vernon Lovejoy, and Darrell Welch. 2004. *Water Recreation Opportunity Spectrum Users' Guidebook*. Lakewood, CO: USDI, Bureau of Reclamation. [http://www.usbr.gov/pmts/planning/wros/wros\\_report.pdf](http://www.usbr.gov/pmts/planning/wros/wros_report.pdf) (Accessed April 27, 2011).
- Jones, Judy J. 1986. *Scenic Lakes Evaluation for the Unorganized Towns in Maine*. Augusta, ME: Maine Department of Conservation and Maine State Planning Office.
- Kleinschmidt. 2012a. Bowers Wind Project User Survey. Pittsfield, ME: Kleinschmidt. 40 pp. plus the questionnaire, graphs of results, and simulations.

Kleinschmidt. 2012b. Baskahegan Lake User Survey. Pittsfield, ME: Kleinschmidt. 23 pp. plus the questionnaire, graphs of results, and a comparison of the 2010 and 2012 Baskahegan survey methods.

LandWorks. 2012. *Visual Impact Assessment for the Proposed Bowers Wind Project*. Middlebury, VT: LandWorks. 129 pp. plus maps, photo inventory, and visual simulations.

Maine, Department of Conservation. 2009a. Designated Scenic Viewpoints of State or National Significance, Located on Public Reserved Land or on a Publicly Accessible Trail Used Exclusively for Pedestrian Use, for Consideration in the Permitting of Expedited Wind Energy Development. <http://www.maine.gov/doc/DraftRule/DraftScenicRule.pdf> (accessed March 11, 2010).

Maine, Department of Conservation, Bureau of Parks and Lands. 2009b. *Maine State Comprehensive Outdoor Recreation Plan 2009-2014*. <http://www.maine.gov/doc/parks/programs/SCORP/contents.html> (accessed March 3, 2010).

Mitchell, Christi A. 2011. RE: another wind project from Jim Palmer. Email dated April 21, 2011.

Mohney, Kirk. 2011. Scenic Impact Question. Email dated May 3, 2011.

O'Shea, Robert P. 1991. Thumb's rule tested: visual angle of thumb's width is about 2 deg. *Perception* 20(3): 415-418. <http://www.perceptionweb.com/abstract.cgi?id=p200415> (Accessed January 15, 2010).

Palmer, James F. 1996. Public Acceptance Study of the Searsburg Wind Power Project: Pre-construction Baseline. South Burlington, VT: Green Mountain Power Corp. 60 p. + appendices.

Palmer, James F. 2012. Maine's experience evaluating when scenic impacts from wind energy development are unreasonably adverse. In National Association of Environmental Professionals 37th Annual Conference Proceedings, Portland, Oregon, May 21-24, 2012. pp. 602-620

Palmer, James F. 2000. Reliability of rating visible landscape qualities. *Landscape Journal* 19(1/2):166-178.

Palmer, James F. 1999. Recreation participation and scenic value assessments of clearcuts. In *Proceedings of the 1998 Northeastern Recreation Research Symposium*, edited by H.G. Vogel song. Gen. Tech. Rep. NE-255. Radnor, PA: USDA, Forest Service, Northeastern Forest Research Station. pp. 199-203.

Palmer, James F. and Robin E. Hoffman. 2001. Rating reliability and representation validity in scenic landscape assessments. *Landscape and Urban Planning* 54(1-4):149-161.

- Palmer, J., and J. Roos-Klein Lankhorst. 1998. Evaluating visible spatial diversity in the landscape. *Landscape and Urban Planning* 43(1-3): 65-78.
- Parkin, Drew, John Lortie, Robert Humphrey, and Fred DiBello. 1989. *Maine's Finest Lakes: Results of the Maine Lakes Study*. Augusta, ME: Maine Critical Areas Program, State Planning Office.
- Portland Research Group. 2011a. *Bowers Mountain Wind Project Outdoor Activities Users Research Telephone Survey*. Portland, ME: Portland Research Group. 40 p.
- Portland Research Group. 2011b. *Bowers Mountain Wind Project Outdoor Activities Users Research Snowmobiler Survey*. Portland, ME: Portland Research Group. 32 p.
- Sheppard, Stephen R. J. 1989. *Visual Simulation: A User's Guide for Architects, Engineers, and Planners*. New York: Van Nostrand Reinhold.
- Stamps, Authur E. 2000. *Psychology and the Aesthetics of the Built Environment*. Boston: Kluwer Academic Publishers.
- Stantec Consulting. 2012a. Section 30.0 Visual Impact. Champlain Wind, LLC.
- Stantec Consulting. 2012b. *Bowers Wind Project Response to Palmer Data Request*. December 12, 2012. CD-ROM.  
<http://www.maine.gov/doc/lurc/projects/Windpower/FirstWind/Champlain/Development/Application/Narrative.pdf> (Accessed April 22, 2011).
- USDA, Forest Service. 1995. [page revisions 2000] *Landscape Aesthetics: A Handbook for Scenery Management*. Agricultural Handbook Number 701.  
<http://www.esf.edu/es/via/> (accessed March 11, 2010).
- USDA, Forest Service. 1982. *ROS User's Guide*.  
[http://www.fs.fed.us/cdt/carrying\\_capacity/rosguide\\_1982.pdf](http://www.fs.fed.us/cdt/carrying_capacity/rosguide_1982.pdf) (accessed June 3, 2011).
- USGS. 2009a. *National Elevation Dataset (NED)*.  
[http://eros.usgs.gov/#/Find\\_Data/Products\\_and\\_Data\\_Available/NED](http://eros.usgs.gov/#/Find_Data/Products_and_Data_Available/NED) (accessed April 26, 2010).
- USGS. 2009b. *Vertical Accuracy of the National Elevation Dataset*.  
[http://ned.usgs.gov/downloads/documents/NED\\_Accuracy.pdf](http://ned.usgs.gov/downloads/documents/NED_Accuracy.pdf) (accessed April 26, 2010).
- Zube, Ervin, and Charles Law. 1984. Perceptions of the sky in five metropolitan areas. *Urban Ecology* 8(3): 199-208.

# Appendix 1

## Review Maps

Map 1: Topographic Viewshed for Blade Tip

Map 2: Forested Viewshed for Blade Tip

Map 3: Topographic Viewshed for Turbine Hub

Map 4: Forested Viewshed for Turbine Hub

Visibility analysis determines whether a line-of-sight exists between two specified points. A geographic information system (GIS) is used to map the viewsheds from which the Bowers' Wind Project's turbines are potentially visible. In principle this is an objective exercise in geometry highly suited to a computer application. In practice however, since the data are only approximations of the actual condition and may include errors and assumptions, the resulting viewshed maps are best considered a preliminary analysis of potential visibility under specified conditions. The maps are useful for providing a preliminary investigation of the overall potential visual impact. If potential visual impacts appear to exist for significant scenic resources, they need to be confirmed through field investigation and other visualization techniques.

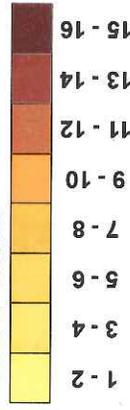
# Map 1 Topographic Viewshed for Blade Tip Bowers Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

## Legend

▲ Turbine Locations

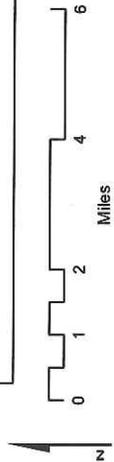
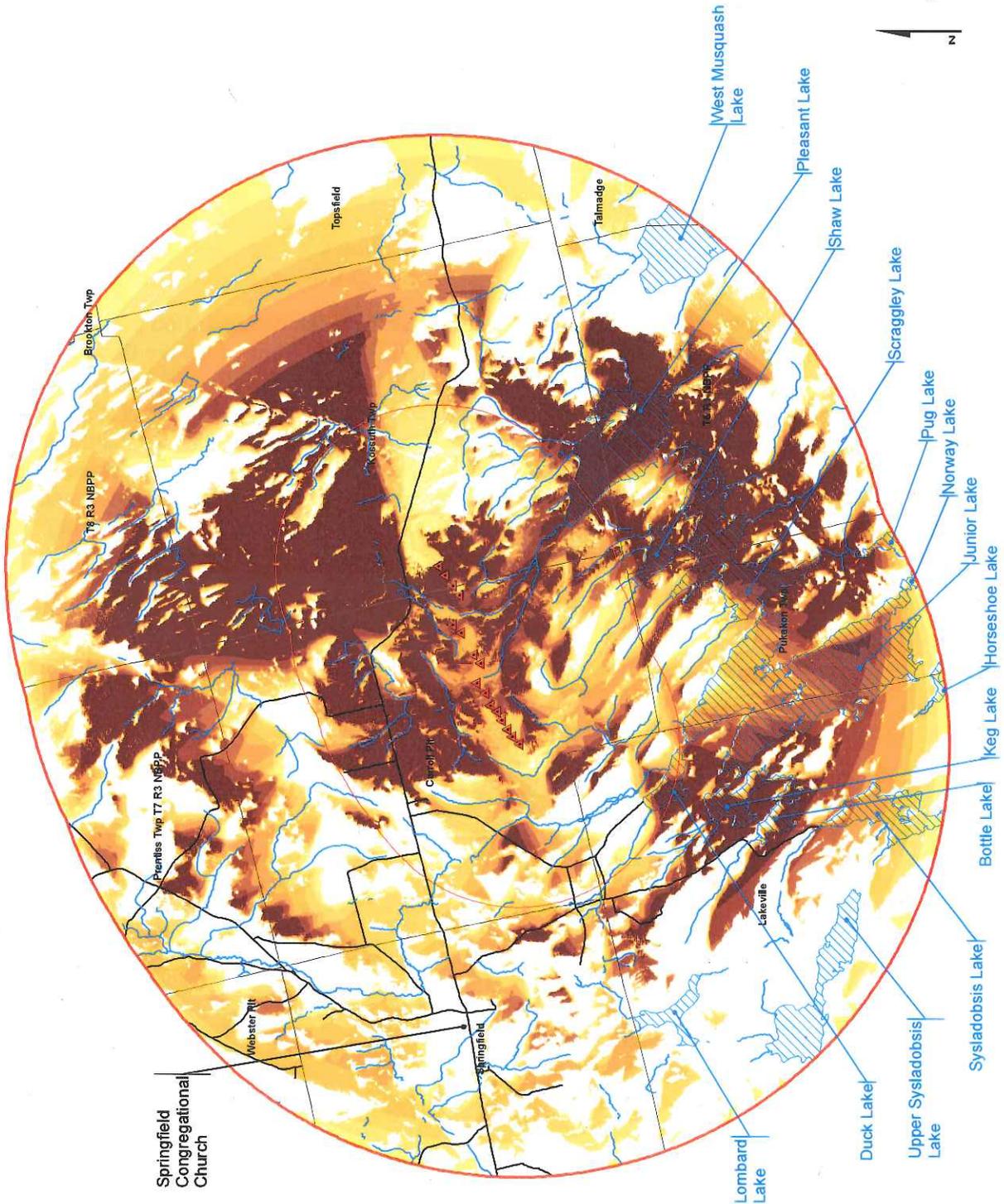
Number Visible



Scenic Resources of State or National Significance

— Great Ponds

— National Register of Historic Places



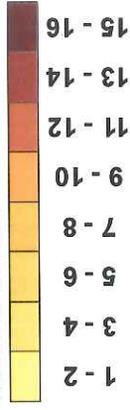
# Map 2 Forested Viewshed for Blade Tip Bowers Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

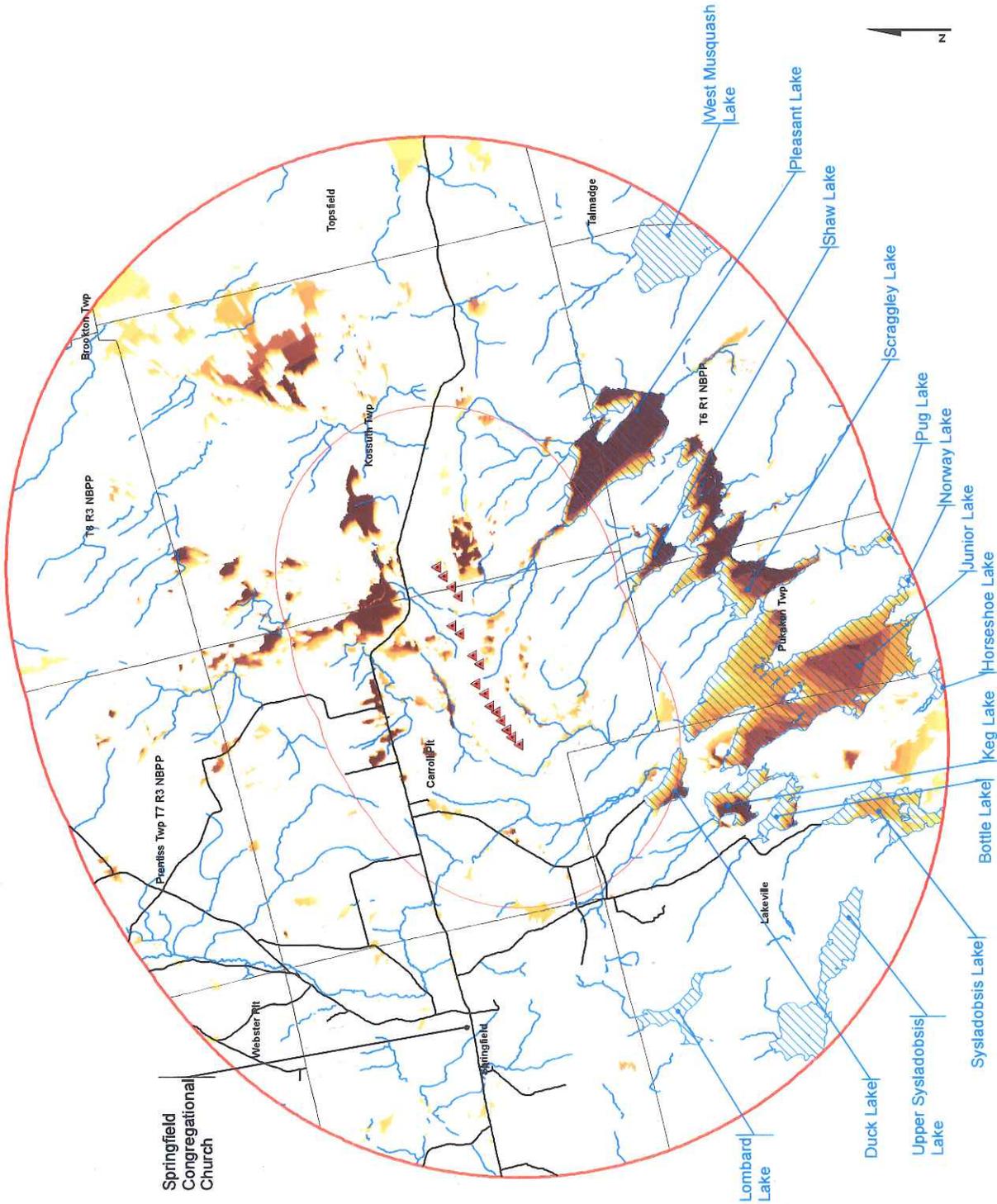
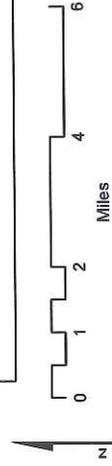
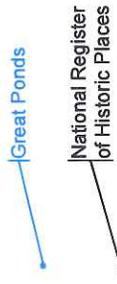
## Legend

▲ Turbine Locations

Number Visible



Scenic Resources of State or National Significance



# Map 3 Topographic Viewshed for Turbine Hub Bowers Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

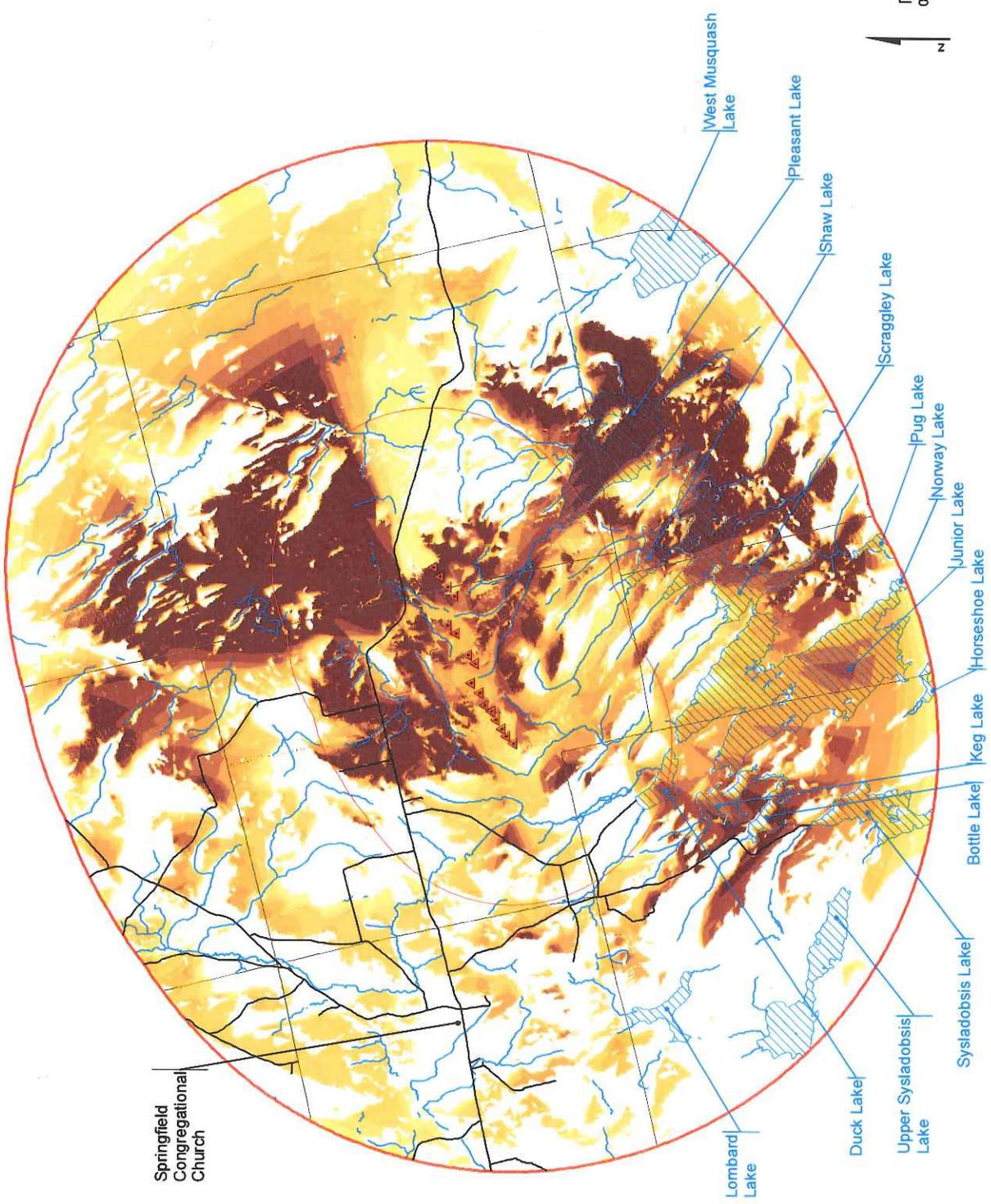
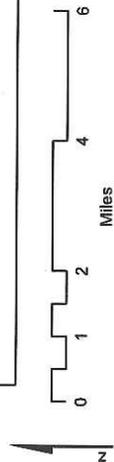
### Legend

- ▲ Turbine Locations

Number Visible
1-2
3-4
5-6
7-8
9-10
11-12
13-14
15-16

### Scenic Resources of State or National Significance

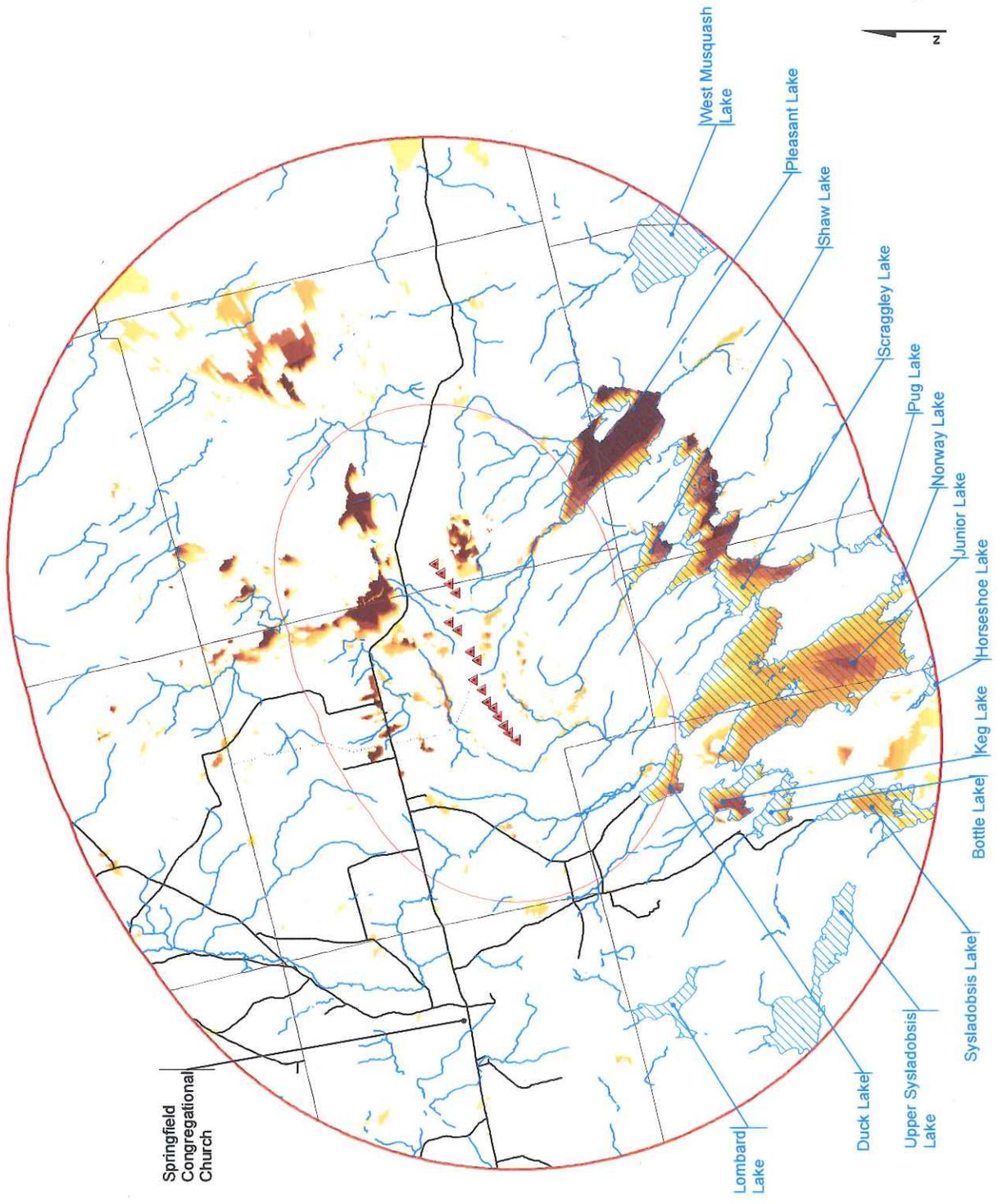
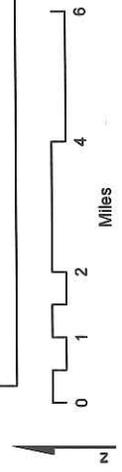
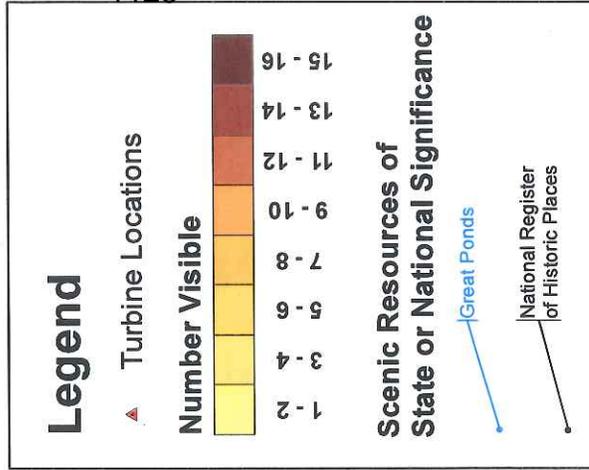
- Great Ponds
- National Register of Historic Places



# Map 4 Forested Viewshed for Turbine Hub Bowers Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

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## Appendix 2

# ArcScene Visualizations

Visualization 1: Bottle Lake

Visualization 2: Duck Lake

Visualization 3: Junior Lake

Visualization 4: Keg Lake

Visualization 5: Pleasant Lake Boat Launch

Visualization 6: Pleasant Lake West

Visualization 7a: Pug Lake (25° horizontal angle of view)

Visualization 7b: Pug Lake (55° horizontal angle of view)

Visualization 8: Scraggly Lake

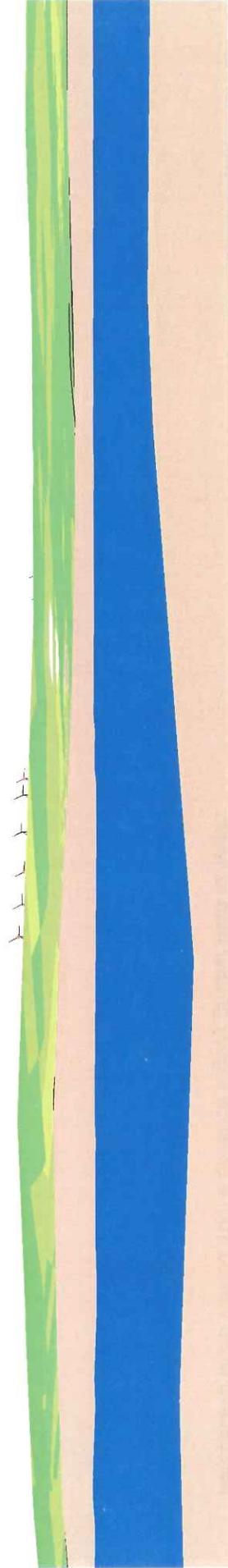
Visualization 9: Shaw Lake

Visualization 10: Sysladobsis Lake

The purpose of these visualizations is to validate the relative accuracy of the *Visual Impact Assessment for the Bowers Wind Project* photographic simulations (LandWorks 2012, Exhibits 11–20). They are created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. A red dot is placed above the nacelle of those turbines that have been identified as having FAA aviation warning lighting. The horizontal angle of view is 55 degrees, which is similar to the VIA photosimulations, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.

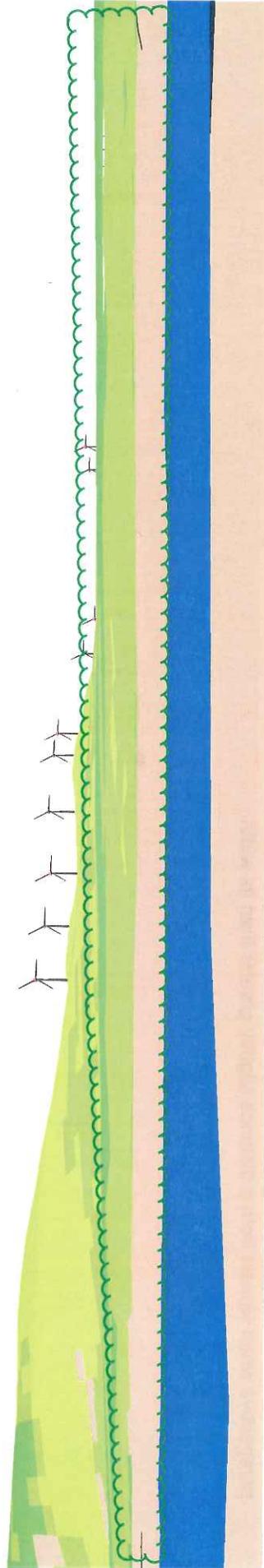
### ArcScene Visualization 1: Bottle Lake

The purpose of this visualization is to validate the relative accuracy of Exhibit 11: Visual Simulation from Bottle Lake, Lakeville (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



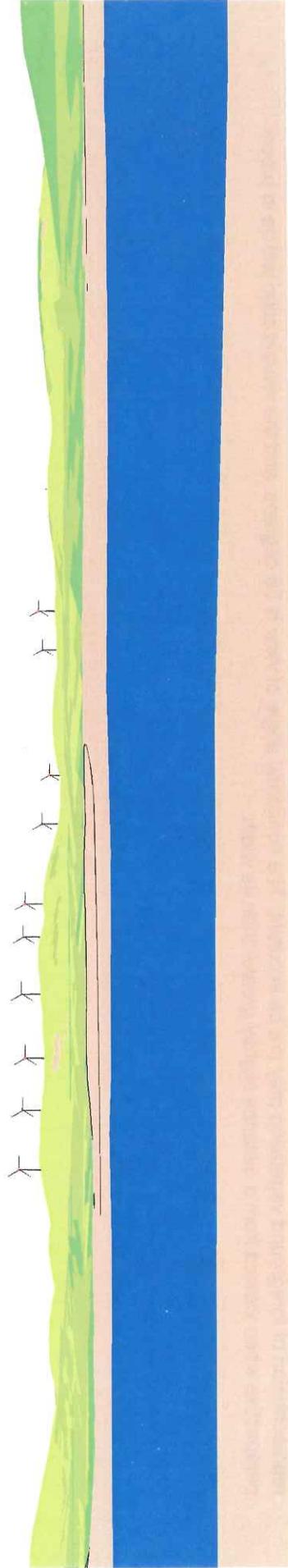
### ArcScene Visualization 2: Duck Lake

The purpose of this visualization is to validate the relative accuracy of Exhibit 12: Visual Simulation from Duck Lake, Lakeville (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



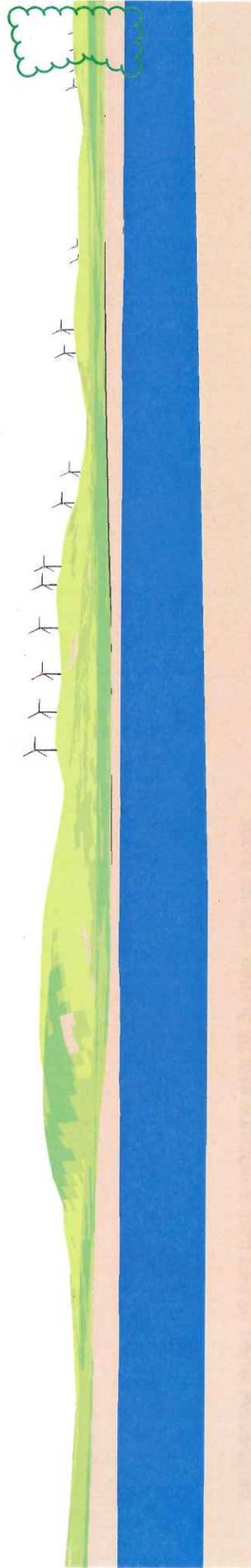
### ArcScene Visualization 3: Junior Lake

The purpose of this visualization is to validate the relative accuracy of Exhibit 13: Visual Simulation from Junior Lake, Lakeville (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



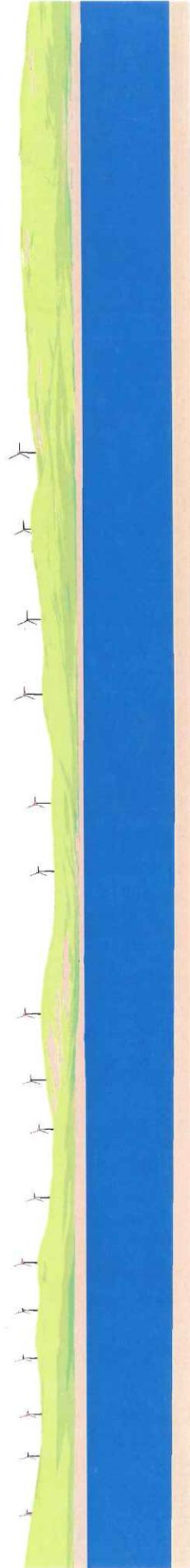
#### ArcScene Visualization 4: Keg Lake

The purpose of this visualization is to validate the relative accuracy of Exhibit 14: Visual Simulation from Keg Lake, Lakeville (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



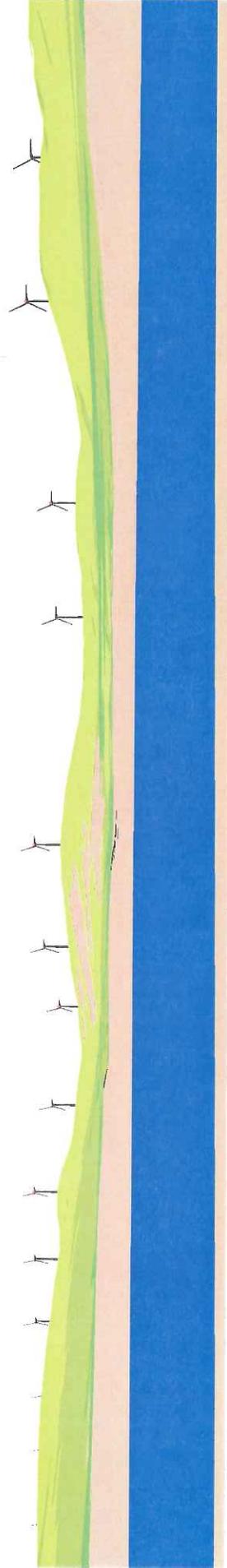
### ArcScene Visualization 5: Pleasant Lake Boat Launch

The purpose of this visualization is to validate the relative accuracy of Exhibit 15: Visual Simulation from Pleasant Lake Boat Launch, T6 R1 NBPP (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



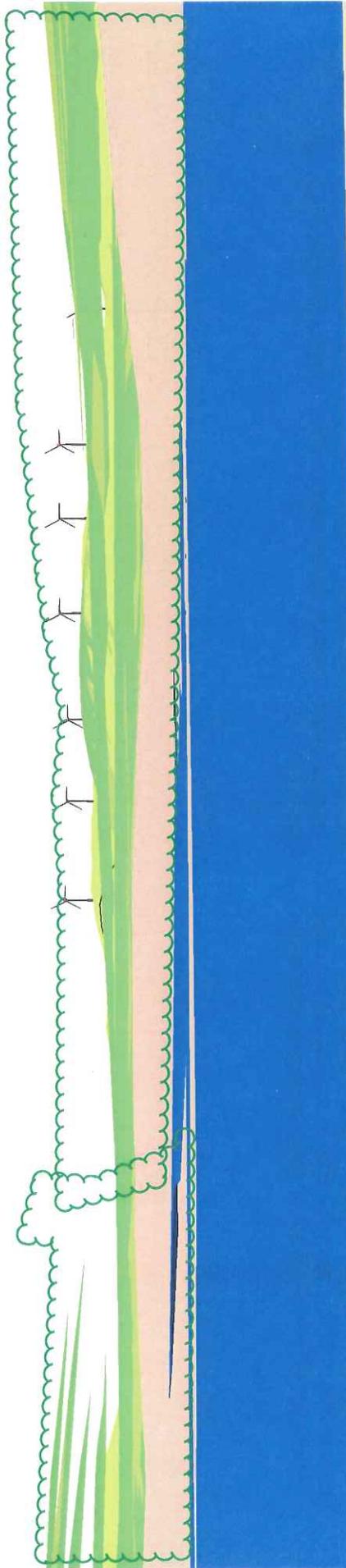
**ArcScene Visualization 6: Pleasant Lake West**

The purpose of this visualization is to validate the relative accuracy of Exhibit 16: Visual Simulation from Pleasant Lake West, T6 R1 NBPP (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



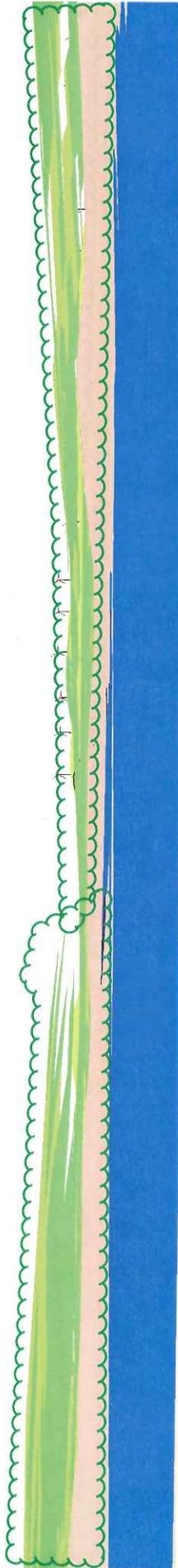
**ArcScene Visualization 7a: Pug Lake (telephoto lens)**

The purpose of this visualization is to validate the relative accuracy of Exhibit 17: Visual Simulation from Pug Lake, Pukakon Twp (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. A moderate telephoto lens was used with a 25-degree horizontal angle of view. The result is that the simulation is slightly magnified compared to the other simulations. As a result the visualization will be in proper perspective when viewed from a distance approximately 1.6 times its width.



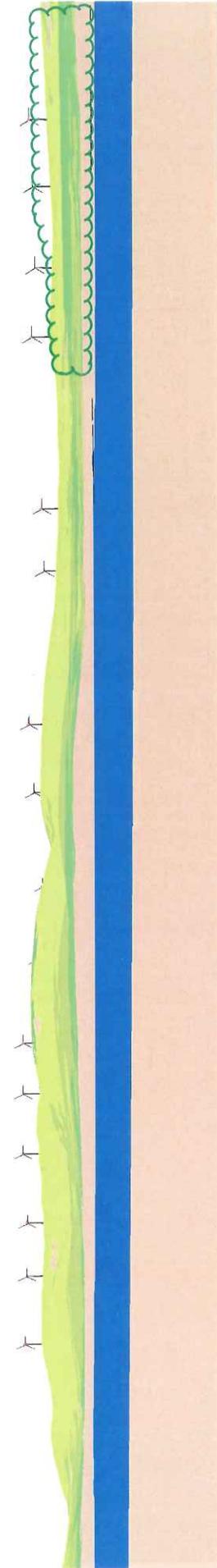
**ArcScene Visualization 7b: Pug Lake (normal lens)**

The purpose of this visualization is to validate the relative accuracy of Exhibit 17: Visual Simulation from Pug Lake, Pukakon Twp (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



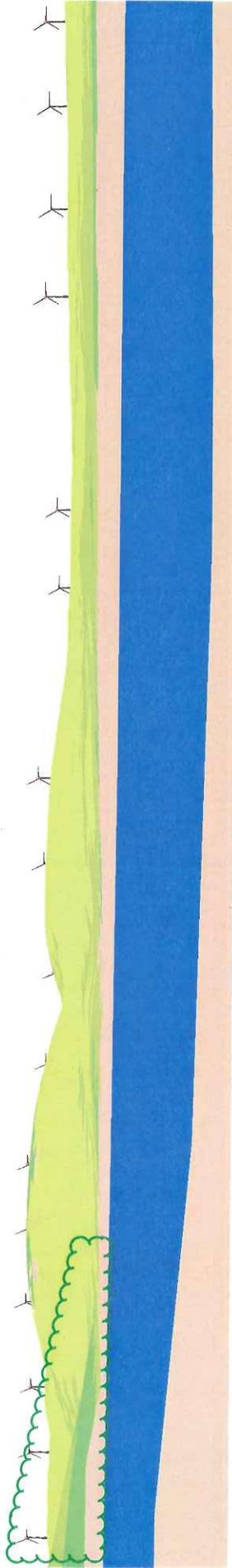
### ArcScene Visualization 8: Pleasant Lake West

The purpose of this visualization is to validate the relative accuracy of Exhibit 18: Visual Simulation from Scraggly Lake, Pukakon Twp (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



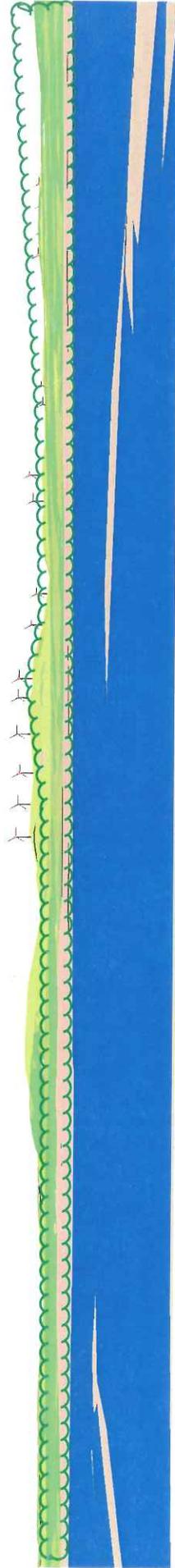
### ArcScene Visualization 9: Shaw Lake

The purpose of this visualization is to validate the relative accuracy of Exhibit 19: Visual Simulation from Shaw Lake, T6 R1 NBPP (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



**ArcScene Visualization 10: sysladobsis Lake**

The purpose of this visualization is to validate the relative accuracy of Exhibit 20: Visual Simulation from Sysladobsis Lake, Lakeville (LandWorks 2012). It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Visual Impact Assessment for the Bowers Wind Project*. Forest cover is set to 40 feet, and does not include forested wet lands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. The horizontal angle of view is 55 degrees, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



Review of the Bowers Wind Project Visual Impact Assessment by James F.  
Palmer  
Prepared for DEP March 8, 2013

Part 2: Independent Analysis

**Review of the  
Bowers Wind Project  
Visual Impact Assessment  
Part 2: Independent Analysis**

**James F. Palmer**

Scenic Quality Consultants  
Burlington, Vermont

Prepared for  
Department of Environmental Protection  
Augusta, Maine

March 8, 2013

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## 1. Introduction

On October 25, 2012, Maine's Department of Environmental Protection (DEP) accepted as complete Champlain Wind LLC's permit application for the Bowers Wind Project. This project has a nameplate capacity of 48 megawatts (MW) generated by 16 Vestas V112-3.0 wind turbines. The turbines are located on the ridges of Bowers Mountain, and Dill Hill in Kossuth Township, Washington County, Maine. The project is within the area designated for expedited grid-scale wind development.

LandWorks prepared the visual impact assessment (VIA) for this project (LandWorks 2012). The adequacy of this VIA was reviewed in a separate document (Palmer 2013). The current document presents my independent analysis of the potential scenic impacts that may be caused by the Bowers Wind Project. The analysis may not be as thorough as a complete VIA, due to time and budgetary constraints. Its primary purpose is to demonstrate an approach that responds to the Maine Wind Energy Act's (WEA) Evaluation Criteria in a valid and reliable way. By valid I mean that the evaluation directly addresses what the WEA criteria require; by reliability I mean that another knowledgeable qualified professional would obtain similar results.

The current report reviews the fieldwork conducted to understand the Bowers Wind Project. This fieldwork checked the general veracity of the VIA's assertion about landscape character, project visibility, and extent of use. In addition, three special topics were considered: the experience of 'enclosure' and 'looming,' the appearance of FAA aviation warning lights on water, and a comparing the experience viewing turbines and a photograph of turbines.

### 2.1 Project Description.

The Bowers Wind Project turbines are located on the ridges of Bowers Mountain, and Dill Hill in Kossuth Township, Washington County, Maine. The project is within the area designated for expedited grid-scale wind development. The generation facilities include:

- **Turbines.** Sixteen 3.0 MW turbines produce a nameplate capacity of 48 megawatts (MW). For the purposes of analysis, it is assumed that Vestas V112 3.0 MW wind turbines will be used, though a smaller turbine is also being considered. The height to the hub center is 84 meters (approximately 275 feet), plus 56 meters (approximately 184 feet) for the rotor blades, resulting in a total height of 140 meters (459 feet) to the tip of an upright blade. The turbines will be painted a light or white color. Red warning lights will be installed according to Federal Aviation Administration (FAA) guidelines. Typically lights are placed on the ends of a turbine string, and on alternating turbines between them. Champlain Wind LLC indicates that they will install radar-assisted warning lights when they are approved for use by FAA.
- **Mountaintop collector line.** A 34.5 kV overhead collector line runs between the turbines. The wooden poles will range between 35 to 60 feet high and require an 80-foot cleared right-of-way. By and large, the mountaintop collector line is not adjacent to the ridgeline crane path.

Associated facilities include:

- **Roads.** The access road from Route 6 will be 24 feet wide and the ridgeline crane path will be 35 feet wide. There appear to be 8.1 miles of access road and 3.8 miles of crane path profiled in the Summit Civil and Electrical plans (Exhibit 1A). Of this there will be 3.0 miles of new access road and 4.0 miles of new crane path.
- **Turbine pads.** An area of approximately 3 acres or more will need to be cleared around each turbine to facilitate construction. Following construction, stockpiled topsoil will be spread on all but a small area around each turbine and will be revegetated using both seeding and natural revegetation. The VIA indicates that the turbine pads and other disturbed area around the turbines will be revegetated following construction.
- **Building.** An approximately 7,000 square foot single-story Operations and Maintenance building is located north of Route 6, adjacent to the express collector line.
- **Meteorological towers.** There will be one permanent 90-meter (295-foot) guyed lattice meteorological (met) towers. Two addition 90-meter met towers may be temporarily erected, but they will be removed before the completion of construction. The met towers will have a triangular cross section of approximately 18 inches on a side. Met towers will require FAA safety lighting and will be painted a distinctive color pattern.
- **“Express collector” line and substation.** An above ground 34.5 kV express collector line system will bring power from the towers to a new substation where it connects to an existing 115 kV transmission line. The wooden poles will be 40 to 80 feet tall. The 100-foot wide (up to 150-feet at corners) right-of-way will be approximately 5.25 miles long.

## 2. Fieldwork

Fieldwork was conducted on two separate occasions in the company of representative of the developer and permitting agency. The fieldwork associated with the current Bowers Wind Project was conducted on Thursday December 13, 2012. In addition to James Palmer (Scenic Quality Consultants), the party included Jim Beyer and Jessica Damon (DEP), Neil Kiely (First Wind), Joy Prescott (Stantec), David Raphael (LandWorks). As part of the original 27 turbine project’s review, fieldwork was conducted on Wednesday May 18 and Thursday May 19, 2011. In addition to James Palmer (Scenic Quality Consultants), the party included Fred Todd (LURC), Joy Prescott (Stantec) and Patrick Oldtad (LandWorks). On the second day we were guided in a boat by Bill Rafuse. Finally, on Monday June 27, 2011 James Palmer and David Raphael (LandWorks) joined LURC Commissioners Hilton, Laverty, Nadeau, Farrand, and Hammond on a site visit of several interconnected lakes: Bottle Lake, Junior Lake and Scraggly Lake. Other interested parties joined the site visit, but they were in separate boats.

The purposes of this fieldwork included:

- Verify that the VIA presents a reasonable characterization of the landscape condition, particularly from state or nationally significant scenic resources.
- Verify that the visibility analysis maps are reasonably accurate
- Verify that the viewpoints used for the photosimulations are both reasonable and from the locations reported in the VIA.

- Establish an experiential context within which to evaluate the results of the VIA and review analyses.
- Determine whether the experience of “intimate-enclosure” occurred on the potentially effected ponds, and the possibility that the turbines could be experienced as “looming” over someone using these ponds.
- Observe the Rollins Wind Project’s FAA aviation warning lights and note their visual effect.
- Observe the Stetson Wind Project from the Baskahegan Lake boat launch and compare the view to a printed photograph to evaluate the quality of a photographic representation.

No significant discrepancies with the landscape condition described in the VIA were identified, though there may have been more of an emphasis on evidence of development than we experienced. The fieldwork found the visibility maps and photosimulations associated with both Bowers Wind Project VIAs to be reasonable representations of the existing visible conditions and what the visible conditions would be if the project was built as proposed. The adequacy of the VIA visibility analysis and photosimulations are described in more detail in the adequacy review (Palmer 2013).

The fieldwork appeared to confirm that these lakes were not heavily used either in late spring or winter. Will Rafuse estimated that on a big day (4<sup>th</sup> of July weekend) there might be as many as 5 boats on Scraggly Lake at one time; primarily fishing. This supports the summer observations made by Stantec in 2011 and Kleinschmidt in 2012 as summarized in Table 1 (Kleinschmidt 2012a, p. 10-23; Stantec 2012).

**Table 1. Average Number of Boats and People Observed at Water Locations**

Location	Boats		People	
	2011	2012	2011	2012
Junior Stream	3.5	3.3	8.7	7.6
Junior Lake		7.3		14.3
Pleasant Lake		5.5		11.2
Scraggly Lake		3.0		6.2
Shaw Lake		0.0		0.0

*Note:* These results are calculated from the data described in Kleinschmidt (2012a).

### 3.1 Experience of ‘enclosure’ and ‘looming.’

The review of the first Bowers Wind VIA postulated that the experience of “enclosure” while on a pond might interact with the experience of the turbines as “looming” over users on a pond to create greater sensitivity to the visual impacts of the turbines. One of the objectives of the fieldwork was to determine if enclosure and looming are meaningful and useful concepts in the context of the Bowers Wind Project. This issue was discussed during all three site visits.

“Enclosure” is used here to describe the feeling of being surrounded or enfolded by the landscape, and is contrasted with a feeling of spaciousness (Palmer and Lankhorst 1998). It is hypothesized that on a small lake or pond with little development and a forested shoreline (and perhaps surrounding nearby hills or mountains) a recreation user may have an especial intimately experience of being alone with nature. In other words the feeling and sights are all focused near the observer or “in here.” This is in contrast to the panoramic view from a mountain peak or

ridge where the feeling is that the observer is looking at things “out there.” It is hypothesized that someone viewing visual impacts “in here” will experience being affronted by them, while someone looking at visual impacts “out there” will feel that the turbines are more distant, less imposing and may even offer a focus of interest.

This hypothesis was investigated during the boat excursion on Scraggly, Junior and Duck Lakes with the LURC Commissioners. We began discussing the feeling of enclosure soon after embarking. Not everyone seemed to understand the concept at first, perhaps because it was not present as we crossed Junior Lake to Scraggly Lake where the water setting is too expansive. Even on Scraggly Lake the setting was too expansive; however everyone recognized the change when we arrived at the eastern end of Scraggly Lake. At this point the question was whether the feeling of enclosure could shift to being “intimate.” We stopped at five locations that I thought had the potential to support the feeling of enclosure and possibly intimate enclosure. The height of the shoreline trees and width of the pond was measured at each location using a Nikon Forestry 550 hypsometer and later verified using the project GIS (in general observations were made close to equidistant from the nearby shores). The results are summarized in Table 2. Everyone agreed that there was some sense of enclosure when the total width of the open water was less than 30 or 40 times the height of the surround shoreline trees and intimate when the ratio was 1:10 or 1:15. This sample is admittedly small and informal; it certainly was not adequate to understand how nearby hills or mountains might influence this feeling. However, if these thresholds are accurate, there are very few locations where a person would have a feeling of intimate enclosure and have potential visibility of the Bowers turbines.

**Table 2. Experience of Enclosure**

Location	Feels enclosed	Tree height (ft.)	Pond width (ft.)	Ratio
Scraggly Lake—eastern end	Enclosed	60	1,000	1:15
Scraggly Lake—northern tip	Intimate	60-70	650	1:10
Junior Lake—northern end	Slightly enclosed	65 plus hills	2,500	1:40
Duck Lake—east inlet	Intimate	65-70	1,000	1:15
Duck Lake—east side	No	65-70	2,000	1:30

“Looming” is used here to describe the feeling of someone or something overshadowing and looking down at a viewer. It is hypothesized that when experiencing a feeling of intimate enclosure, such as boating on a small lake or pond with little to no evidence of human presence, a person will be particularly susceptible to feeling that the looming presence of turbines is an intrusive affront. We discussed this concept while viewing the photosimulations on Scraggly and Duck Lakes. It was thought that such a feeling could exist, for instance if there were turbines on Penobscot Bald, about 1.5 miles from a viewer at the northern end of Scraggly Lake. The possibility for this feeling was much less apparent to us on Duck Lake where the turbines in the photosimulation were visible above the shoreline trees at least 3 miles distant. To develop the sense of looming, it is hypothesized that the turbines must be seen as dominant over the shoreline trees. In the Duck Lake photosimulation they occupy an area at least half the vertical visual angle of the shoreline trees (i.e., as measured on the photosimulation, the tree are approximately three-quarters of an inch high and the turbines are up to half an inch high). While the situation on Duck

Lake helped us understand the potential for a sense of looming to exist, we saw this as an example approaching the sense of looming; none of us thought that it was achieved here.

While it appears that feelings of “intimate enclosure” and “looming” may be possible and may create a situation where observers will be particularly sensitive to scenic impacts, this is still very much a hypotheses that requires further investigation.

### 3.2 Appearance of FAA aviation warning lights on water.

Members of the public in the past have expressed concern about the significant scenic impacts of the FAA aviation warning lights. At the June 2011 hearings for the original Bowers Wind Project, the photo in Figure 1 was circulated. This photo is of the Rollins Wind Project looking from the gazebo park in Lincoln, ME over Mattanawcook Pond. At the time I dismissed it as being either an edited photo or an effect resulting from the long exposure time.

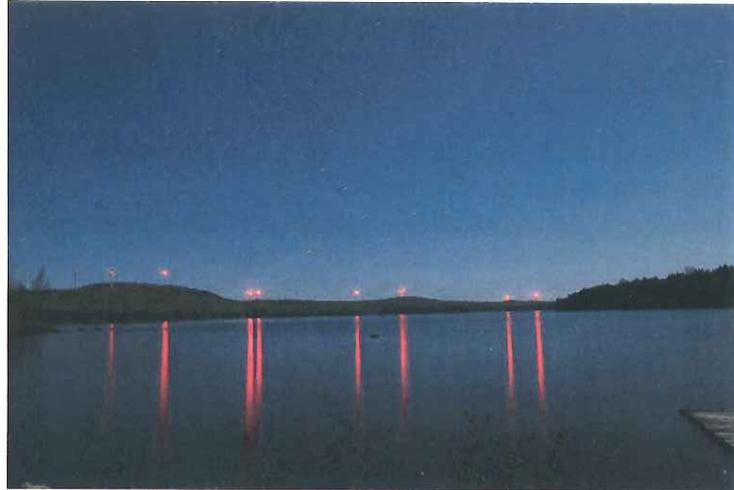


Figure 1. FAA warning lights streaking across the water at night.

However I went and checked that night and found it was a very good representation of what I saw; the

same phenomenon was apparent the next night too. What is not captured in the photograph is that the lights flash on and off, perhaps 20 times a minute. I returned to Lincoln for the December 2012 fieldwork, and saw the same phenomenon, but the next night the pond was frozen and the effect was barely visible. This phenomenon appears to happen when there are ripples on the water that present many continuous reflective surfaces. It does not appear to be unusual; I observed it on three of four visits to this site and the lake was frozen on the fourth visit. This issue was discussed further in Part 1 of my review.

### 3.3 Comparing the experience of viewing turbines and a photograph of turbines.

In the December 2012 field visit a photograph of the Stetson Wind Project as seen from the Baskahegan Lake boat launch was compared to the actual view. The photograph was printed at the same approximate size and quality as the VIA simulations were for the VIA. At 9.3 miles, the turning turbine blades appeared crisp and clear to me. However, the turbines in the photograph were not as crisp or clear. I believe that the difference is in part that the resolution of the photograph and the printer were not sufficient to represent the detail which I was observing. I would note that in this case the turbines are beyond the distance the WEA recognizes the potential for significant scenic impacts.

I would like to introduce the notion that there are two types of observers in the landscape, the “Casual Viewer” and the observer with a “Critical Eye”. We have been evaluating the appropriate minimum resolution of the photosimulations using the guidelines for constructing the

Snellen eye chart—the letter is 5 minutes high and is composed of lines that are 1 minute wide. The Snellen eye chart is used to measure recognition visual acuity and this standard appears to work well for the Casual Viewer. However, human visual acuity is sharper than 1 minute of arc and a focused viewer with a Critical Eye can see greater detail in the landscape. I hypothesize that while hiking or fishing, most people are Casual Viewers. However, someone who has stopped particularly to appreciate a scenic view may very likely be a “Critical Eye.” This is a distinction that I have observed in other contexts, but I am unaware of any relevant research linking it to scenic impact assessment.

### 3. Methods

In addition to conducting fieldwork and reviewing existing materials such as the VIA, original analyses made extensive use of ArcGIS (ESRI 2012) software to evaluate potential visibility of the project. An independent evaluation of the Bowers intercept survey was also conducted.

**Visibility of the Bowers Wind Project.** The four viewshed maps prepared to investigate several issues associated with the Bowers Wind Project are included in Appendix 2. The first two maps investigate the greatest possible area from which a part of any turbine could possibly be visible. In this case it is an upraised blade tip 428 feet (130.5 meters) above the ground. Two different constraints on visibility are considered: (1) just bare topography and (2) topography with forest cover. The resulting viewshed maps are:

Map 1: Topographic Viewshed for Blade Tip

Map 2: Forested Viewshed for Blade Tip

While there may be a line-of-sight to just an upraised blade tip, it may not be noticeable and would never be visually dominant. Therefore another analysis investigates the area from which a significant portion of a turbine could possibly be visible. In this case it is visibility of the turbine hub, located 262.5 feet (80 meters) above the ground. The same two constraints on visibility resulted in the following viewshed maps:

Map 3: Topographic Viewshed for Turbine Hub

Map 4: Forested Viewshed for Turbine Hub

Within two or three miles of a turbine, 20 or 30 feet of the blade may be noticeable, but at further distance the Casual Observer is unlikely to be aware of them. Therefore, the forested viewshed for turbine hubs, which also will include the full length of at least the upright moving blades, is a better representation of what users of SRSNS are likely to actually experience.

#### 4. Evaluation of Scenic Impacts

This section evaluates the scenic impact from the Bowers Wind Project based on my understanding of the Wind Energy Act's Evaluation Criteria. It is my objective to illustrate an approach to evaluating scenic impacts based on applying indicators and thresholds appropriate to each of the Evaluation Criteria.

The use of indicators is becoming common for all types of assessment, from learning outcomes and public health, to investment portfolios and environmental impacts. This approach can also be applied to landscape character and scenic impact assessment (Tveit et al. 2006; Ode et al. 2008). If one were to adopt their Framework, the Concept being evaluated is Scenic Impact, and the Dimensions are analogous to the Evaluation Criteria. Attributes and Indicators appropriate to the WEA Evaluation Criteria need to be identified (Tveit et al. 2006, p. 233). Finally, to be relevant to the WEA, Indicator Thresholds need to be identified that help determine when scenic impacts are Not Adverse, Adverse or Unreasonably Adverse.<sup>1</sup> The objective is to identify Indicators and Thresholds that are directly relevant to the statutory Evaluation Criteria and that can be applied reliably (independent objective measurement by competent experts produce similar results). This is a major shift from reliance on professional judgment, where the developer's expert supports a project and the opponent's expert condemns the project.

##### 4.1 Evaluation Criteria

The WEA requires that the following Evaluation Criteria be considered in determining scenic impacts of an expedited wind energy development.<sup>2</sup>

- A. The significance of the potentially affected scenic resource of state or national significance;
- B. The existing character of the surrounding area;
- C. The expectations of the typical viewer;
- D. The expedited wind energy development's purpose and the context of the proposed activity;
- E. The extent, nature and duration of potentially affected public uses of the scenic resource of state or national significance and the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance; and
- F. The scope and scale of the potential effect of views of the generating facilities on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance and the effect of prominent features of the development on the landscape.

A finding by the primary siting authority that the development's generating facilities are a highly visible feature in the landscape is not a solely sufficient basis for determination that an expedited wind energy project has an unreasonable adverse effect on the scenic character and existing uses related to scenic character of a scenic resource of state or national significance.

<sup>1</sup> 35-A MRSA, § 3452, sub-§1

<sup>2</sup> 35-A MRSA, § 3452, sub-§3

In making its determination under subsection 1, the primary siting authority shall consider insignificant the effects of portions of the development's generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance.

#### 4.2 Rating the importance of the Evaluation Criterion for each Scenic Resource.

The importance of the contribution for each Evaluation Criteria toward reaching a determination of an Unreasonable Adverse scenic impact can be rated as follows:

- **None.** The Evaluation Criterion makes no important contribution toward a determination of Unreasonable Adverse scenic impact. In most cases a rating of None means that there is No Adverse Impact (e.g., there are no people present at possible viewpoints—Criterion E, or the project is not visible—Criterion F).
- **Low.** The importance of the Evaluation Criterion's contribution toward a determination of Unreasonable Adverse scenic impact is low. Low may mean that a project is visible but is not seen as Adverse. Alternately, the scenic impact may be Adverse, but it appears to be within the acceptable range for any type of development (e.g., several blade tips will be partially visible over a forest canopy at a distance of one or more miles—Criterion F, which may be less than the visibility of development located behind a shoreline vegetation management buffer<sup>3</sup>).
- **Medium.** The importance of the Evaluation Criterion's contribution toward a determination of Unreasonable Adverse scenic impact is medium, which is Adverse but typical of wind energy development, and within the range of impacts that the Wind Energy Act anticipates (e.g., a few wind turbine towers may be visible at a distance but there is no sense that they dominate the landscape or significantly compromise views of SRSNS<sup>4</sup>).
- **High.** The importance of the Evaluation Criterion's contribution toward a determination of Unreasonable Adverse scenic impact is high, or beyond what might be considered reasonable even for large highly visible structures in the landscape. A high rating makes the likelihood that the Overall Scenic Impact may be Unreasonably Adverse, but it will likely still depend on the Evaluation Criterion's relationship to the other ratings (e.g., a possible scenario suggesting an Unreasonable Adverse impact might be that the scenic resource is a national icon—Criterion A is High. Though there are only modest numbers of viewers—Criteria E.1 is Low—every user in the intercept survey indicated that their enjoyment will seriously decline—Criteria E.2 is High.).

Thresholds or a similar decision rules need to be identified for each level of importance. These thresholds may be quantitative, but they may also be ordinal or nominal categories.

In addition, a valid and reliable procedure for combining the Indicator ratings into an Overall Scenic Impact rating needs to be described. Current practice is to summarize these ratings in a

<sup>3</sup> <http://www.maine.gov/dep/land/slz/ip-szveg.html>

<sup>4</sup> 35-A MRSA, § 3452, sub-§2(C)

matrix where the SRSNS are listed by row and the Evaluation Criteria are listed by column. This helps the evaluator understand the overall picture, but it is not a procedure for combining the ratings into an Overall Scenic Impact rating. The best that has been done to date is a narrative rationale to support what appears to be a professional judgment. However, a *post hoc* procedure such as this provides no guidance to others about how to determine the Overall Scenic Impact rating under other circumstances. A systematic review of *post hoc* justifications would likely uncover conflicting rules and circular reasoning; a reliable procedure needs to be specified *a priori*.

#### 4.3 Criterion A: Significance of resource.

The WEA identifies designations lists for SRSNS; all of these resources are "scenic" by definition. However, some of them are obviously more "scenic" than others and determining the level of scenic-ness is the objective of this Criterion A. Two indicators will be presented here: (1) significance ratings from designation reports, and (2) significance based on the Chapter 315 definition.

##### 4.3.1 Scenic Resources of State or National Significance (SRSNS). The WEA presents a clear delineation of areas to be evaluated for scenic impacts.<sup>5</sup>

"Scenic resource of state or national significance" means an area or place owned by the public or to which the public has a legal right of access that is:

- A. A national natural landmark, federally designated wilderness area or other comparable outstanding natural and cultural feature, such as the Orono Bog or Meddybemps Heath;
- B. A property listed on the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966, as amended, including, but not limited to, the Rockland Breakwater Light and Fort Knox;
- C. A national or state park;
- D. A great pond that is:
  - (1) One of the 66 great ponds located in the State's organized area identified as having outstanding or significant scenic quality in the "Maine's Finest Lakes" study published by the Executive Department, State Planning Office in October 1989; or
  - (2) One of the 280 great ponds in the State's unorganized or deorganized areas designated as outstanding or significant from a scenic perspective in the "Maine Wildlands Lakes Assessment" published by the Maine Land Use Regulation Commission in June 1987;
- E. A segment of a scenic river or stream identified as having unique or outstanding scenic attributes listed in Appendix G of the "Maine Rivers Study" published by the Department of Conservation in 1982;
- F. A scenic viewpoint located on state public reserved land or on a trail that is used exclusively for pedestrian use, such as the Appalachian Trail, that the Department of Conservation designates by rule adopted in accordance with section 3457;

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<sup>5</sup> 35-A MRSA, § 3451, sub-§9

G. A scenic turnout constructed by the Department of Transportation pursuant to Title 23, section 954 on a public road that has been designated by the Commissioner of Transportation pursuant to Title 23, section 4206, subsection 1, paragraph G as a scenic highway; or

H. Scenic viewpoints located in the coastal area, as defined by Title 38, section 1802, subsection 1, that are ranked as having state or national significance in terms of scenic quality in:

- (1) One of the scenic inventories prepared for and published by the Executive Department, State Planning Office: "Method for Coastal Scenic Landscape Assessment with Field Results for Kittery to Scarborough and Cape Elizabeth to South Thomaston," Dominie, et al., October 1987; "Scenic Inventory Mainland Sites of Penobscot Bay," Dewan and Associates, et al., August 1990; or "Scenic Inventory: Islesboro, Vinalhaven, North Haven and Associated Offshore Islands," Dewan and Associates, June 1992; or
- (2) A scenic inventory developed by or prepared for the Executive Department, State Planning Office in accordance with section 3457.

Based on these definitions, there are 15 SRSNS within 8 miles of a wind turbine. One is a historic site listed on the National Register of Historic Places—Springfield Congregational Church. The remaining 14 are great ponds.

**Table 3. SRSNS Great Ponds' Effected Area**

Great Ponds	Effected Area (within 8-miles of turbines)	
	Area (acres)	Perimeter (miles)
Bottle Lake	258	5.3
Duck Lake	262	3.6
Horseshoe Lake	69	2.1
Junior Lake	4,000	28.8
Keg Lake	371	6.5
Lombard Lake	277	5.4
Norway Lake	36	1.4
Pleasant Lake	1,550	12.0
Pug Lake/Junior Bay (West Grand Lake)	98	2.5
Scraggly Lake	1,641	22.3
Shaw Lake	251	4.6
Sysladobsis Lake	689	10.8
Upper Sysladobsis Lake	1,039	10.6
West Musquash Lake	1,003	6.0

Note: Values are from the GIS database and only include the area within 8 miles of the wind turbines; they may differ slightly from other sources.

**4.3.2 Significance identified in the designation documents.** In many cases, when a SRSNS receives its designation there is supporting report that marshals the evidence concerning its significance. For instance, the National Register of Historic Places Inventory—Nomination Form for the Springfield Congregational Church indicates that the privately owned, but access is unrestricted (section 3). The section where the State Historic Preservation Officer is to evaluate

and certify the significance of the property within the state is not completed (section 12), though similar properties indicate that the resource is of local significance. The nomination does not discuss the scenic value of the setting or landscape in the description (section 7) or significance (section 8) narratives. The rating for this Indicator is Low, based on the probability that this site is of local significance within the state and that scenic value of its surroundings does not mentioned.

The WEA designates great ponds as SRSNS if were identified as having significant or outstanding scenic quality in *Maine's Finest Lakes* (Parkin et al. 1989) or *Maine Wildlands Lakes Assessment* (Giffen et al. 1987). The basis for the scenic quality ratings in these two reports is the fieldwork reported in the *Scenic Lakes Evaluation for the Organized Towns in Maine* (Parkin and Lortie 1989) and the *Scenic Lakes Evaluation for the Unorganized Towns in Maine* (Jones 1986). The process used in these reports is clearly stated. A procedure is used to evaluate and assign points to 6 lake attributes associated with scenic quality: relief, physical features, shoreline configuration, vegetation diversity, special features, and inharmonious development. A total of 100 is possible; it appears that lakes with 50 or more points are identified as Outstanding and lakes with 20 to 45 points are Significant.<sup>6</sup> There are approximately 2,378 lakes 10 acres or larger in the state; 6.1% are an Outstanding and 8.7% are a Significant scenic resource.

Based on these results, I suggest the following thresholds for significance based on the scenic lakes studies: a rating of 20 to 35 is Low, 40 to 55 is Medium and 60 or higher is High.

The total assessment points and significance rating for each of the great ponds that are SRSNS within 8 miles of the turbines are listed in Table 4.

**Table 4. Great Ponds' Significance from Maine Wildlands Lakes Assessment**

Great Ponds	Total Points	Rating
Bottle Lake	35	Significant
Duck Lake	30	Significant
Horseshoe Lake	35	Significant
Junior Lake	45	Significant
Keg Lake	30	Significant
Lombard Lake †	55	Outstanding
Norway Lake	45	Significant
Pleasant Lake	50	Outstanding
Pug Lake/Junior Bay (West Grand Lake)	65	Outstanding
Scraggly Lake	45	Significant
Shaw Lake	40	Significant
Sysladobsis Lake	45	Significant
Upper Sysladobsis Lake †	40	Significant
West Musquash Lake	55	Outstanding

<sup>6</sup> While the *Scenic Lakes Evaluation for the Organized Towns in Maine* (Parkin and Lortie 1989) applied a more restrictive thresholds (60 for Outstanding and 40 for Significant), it appears that the thresholds from *Scenic Lakes Evaluation for the Unorganized Towns in Maine* (Jones 1986) is used in both *Maine's Finest Lakes* (Parkin et al. 1989) or *Maine Wildlands Lakes Assessment* (Giffen et al. 1987).

**4.3.3 Significance based on the visitor catchment area.** A common way to distinguish the significance of a recreation resource is whether it attracts a large number of its visitors from the local, regional, state, national or international population. Maine DEP currently uses this type of Indicator to determine the significance of scenic resources.<sup>7</sup>

A scenic resource visited by large numbers who come from across the country or state is generally considered to have national or statewide significance. A scenic resource visited primarily by people of local origin is generally of local significance. Unvisited places either have no designated significance or are “no trespass” places.

It might be helpful to place the non-Maine resident use in perspective. The Maine SCORP reports that Maine State Parks receive 42% of their use from non-residents (Maine DOC BPL 2009, page III-5). Based on these results, I suggest the following thresholds for significance based on the visitor catchment area: if more than 33% of visitation is from outside of Maine the SRSNS significance is High, if more than 33% is from the local region than the significance is Low, otherwise it is Medium.

The Bowers Wind Project is located in Penobscot and Washington Counties; it is very close to Aroostook and Hancock Counties. Users of the lakes from these counties could be considered regionally local user, while others from Maine would be considered state users. At the national level, I would separate users from the New England or Northeastern from the rest of the country.

Intercept surveys were conducted on the three largest water surfaces within 8 miles—Junior, Pleasant and Scraggly Lakes. One of the questions on the survey was the ZIP code of the respondent’s primary residence; Table 5 summarizes the results. Overall 55% resided in Penobscot or Washington Counties, 26% from the rest of Maine, 8% from New England, and 9% from the rest of the country.

**Table 5. Residence of People Interviewed in the Bowers Survey.**

Residence	Junior Lake	Pleasant Lake	Scraggly Lake
Penobscot	58.3	28.6	58.3
Washington	—	17.9	8.3
Aroostook	—	7.1	—
Hancock	—	—	—
Maine—other areas	25.0	21.4	33.3
New England	12.5	7.1	—
Other Eastern USA	4.2	17.9	—

Since what appear to be the most visited lakes are not drawing a third of their visitors from outside the state, and half or more come from the local region, then it is assumed that the value of this Indicator is Local for all of the great pond SRSNS. We do not have visitation data for the Springfield Congregational Church, but based on a site visit it is expected that visitation is low and local, so the rating would be Low.

<sup>7</sup> Natural Resources Protection Act (NRPA) rule Chapter 315 §10. This rule also appears to have been the basis for the WEA definition of SRSNS.

**4.3.4 Combining Criterion A ratings.** Criterion A has two Indicators. In the absence of evidence that one indicator is more important than the other, I propose to obtain a final rating using an equally weighted combinatorial matrix shown in Figure 2. The ratings for Criterion A are presented in Table 1.

		Indicator 2		
		Low	Medium	High
Indicator 1	Low	Low	Low-Med	Medium
	Medium	Low-Med	Medium	Med-High
	High	Medium	Med-High	High

Figure 2. This generic equally weighted matrix is for combining the ratings of two Indicators.

Table 6. Criterion A Indicator and Final Ratings

SRSNS	Designation Documents	Visitation Catchment	Criterion A Rating
Springfield Congregational Church	Low	Low	Low
Bottle Lake	Low	Low	Low
Duck Lake	Low	Low	Low
Horseshoe Lake	Low	Low	Low
Junior Lake	Medium	Low	Low-Med
Keg Lake	Low	Low	Low
Lombard Lake	Medium	Low	Low-Med
Norway Lake	Medium	Low	Low-Med
Pleasant Lake	Medium	Low	Low-Med
Pug Lake/Junior Bay (West Grand Lake)	High	Low	Medium
Scraggly Lake	Medium	Low	Low-Med
Shaw Lake	Medium	Low	Low-Med
Sysladosis Lake	Medium	Low	Low-Med
Upper Sysladosis Lake	Medium	Low	Low-Med
West Musquash Lake	Medium	Low	Low-Med

#### 4.4 Criterion B: Character of surrounding area.

In general, the purpose in describing landscape character in a VIA is to provide a contextual baseline and determine the attributes that contribute to the area's intrinsic scenic attractiveness (see for instance USDA 1995). A character analysis may also include a description of "sense of place" or more accurately the "sense that people have of a place." In the absence of clear scenic

management objectives, a landscape character assessment can help establish what changes might be reasonable and acceptable.

My understanding of how Criterion B into the WEA scenic impact assessment is to establish the state and regional landscape context within which to evaluate the other criteria. In order to do this the study area for a landscape character analysis should be substantially larger than 8 miles from the proposed generation facilities. The project is sited primarily in the Penobscot County (Highlands region) and Washington county (Downeast region), and the SRSNS within the 8-mile study area are primarily within the Downeast region.

**4.4.1 Ecological units.** *Landscape Assessment* (USDA 1995) begins identifying landscape character by describing the area's ecological units. In Maine, the standard reference is McMahon's *Biophysical Regions of Maine: Patterns in the Landscape and Vegetation*, which places the Bowers Wind Project and surrounding area in the center of the Eastern Interior bioregion. The following summary is taken from Maine's Comprehensive Wildlife Conservation Strategy (DIFW 2005).

**Physiography:** The Eastern Interior Region parallels the East Coastal Region in a 20 to 25 mile band that extends from Great Pond to the St. Croix River just north of Woodland. It includes the main stems and tributaries of the Narraguagus, Pleasant, and Machias Rivers. The topography is gently rolling with elevations averaging between 200' and 400'. Higher hills such as Peaked (938') and Lead (1475') Mountains are scattered throughout the region. Most of these peaks occur on the third largest pluton complex in the state (after Sebago and Katahdin). Smaller intrusions of gabbro and granodiorite are located along the region's seaward boundary. Wide belts of metasedimentary rocks derived from pelites, calcareous sandstones, and sulfidic quartz sandstone occur in the northern half of the region.

**Climate:** The climate shares characteristics of both the Eastern Lowlands and the East Coastal Region. Summer temperatures average 5° warmer than on the coast, with a mean maximum July temperature of 80° F. Winters are cooler and wetter, with a mean minimum January temperature of 5° F and average annual snowfall of 85" (roughly 1' more than the East Coastal Region). Average annual precipitation (47") reflects a strong maritime influence. The frost-free season averages 20 to 40 days shorter than that of the coastal zone.

**Surficial Geology and Soils:** Extensive ice-contact deltas and glaciofluvial deposits occur in the western half of the region. The surficial geology of the eastern half is dominated by large deposits of glaciomarine clays and silts. Till and thin drift are most extensive in the northern portion of the region. One of the state's largest examples of an ice-contact glaciomarine delta, Pineo Ridge, is located in the Towns of Columbia, Deblois, Cherryfield, and T18MD. Colton gravels and Adams sands are common on outwash plains, with poorly drained Vassalboro peats occurring in small pockets along the delta's margins. Colonel and Brayton fine sandy loams are typical of lower areas, with better drained Dixfield and Marlow fine sandy loams occurring on upper slopes and ridge tops.

**Vegetation and Flora:** Except on glacial outwash plains, spruce-fir is the dominant forest type throughout the region. Historically, *Pinus strobus* was abundant on sandy outwash soils.

Most of these areas are now managed blueberry barrens. It is also the southern limit for concentric raised bogs.

The lakes, some of which are interconnected, and the hills and ridges to their north are the landscape features of the study area. The landscape within the study area is natural appearing (as an intensely managed forest it is not pristine) and attractive, but within the context of Maine its scenic quality is typical.

Within the context of Maine, the most distinctive features in the landscape are the great peaks; Maine has 14 peaks that are over 4,000 feet and an additional 33 that are over 3,000 feet high. Within 8 miles of the Bowers Wind Project the hills are up to 1,200 feet high, and cannot be said to be a highly distinctive feature within the context of Maine. Map 5 in Appendix 1 highlights the local peaks within 8 miles of the Bowers Wind Project. There are few peaks to the south around West Grand Lake, and their elevation is also modest.

Several of the lakes within 8 miles of the Bowers Wind Project are sizable, they are not on a scale with Moosehead Lake, Sebego or Chesuncook Lakes; there is a substantial number of lakes larger than Junior, Pleasant or Scraggly Lakes. While the lakes within 8 miles of the project provide an opportunity for linked travel, the area is not recognized for this opportunity in the way The Arnold Trail to Quebec,<sup>8</sup> which is listed on the National Register of Historic Places, or the Northern Forest Canoe Trail<sup>9</sup> are.

**4.4.2 The image of the surrounding area as represented to potential visitors.** One way to investigate the landscape character of an area would be to evaluate the text and images used to represent it to potential visitors. The official government tourism websites offer a relatively objective source of data, in that their task is to represent the best tourism opportunities within the state and its regions. The Maine Office of Tourism is clearly a booster for Maine tourism, but it has no bias toward particular attractions.

A proper characterization would inventory all the images and text on the sampled websites, and then conduct a qualitative content analysis of these data. In this case there are three relevant websites that I have identified: the Maine Office of Tourism website and the official websites for the DownEast & Acadia Region, and Highlands Region. I have perused these sites for reference to SRSNS within 8 miles of the proposed Bowers Wind project; however I have not attempted to conduct a thorough analysis.

**Downeast Maine.** The Maine Office of Tourism focuses on the coastal resources of the Downeast & Acadia Region.<sup>10</sup> If one digs into Maine's DownEast & Acadia Region<sup>11</sup> website, one learns that the project is located in the "Way DownEast and Roosevelt Campobello" area. While other visitor attractions dominate the description of this sub-region, the web site does have this to say about the Grand Lake Stream sub-region:

<sup>8</sup> <http://nrhp.focus.nps.gov/natregsearchresult.do?fullresult=true&recordid=0>

<sup>9</sup> <http://www.northernforestcanoetrail.org/>

<sup>10</sup> <http://www.visitmaine.com/region/downeast/>

<sup>11</sup> <http://www.downeastacadia.com/>

Grand Lake Stream is highly regarded as an eco-tourism area and for more than a century, the area has been known as a sportsman's paradise. ... As soon as the ice is out in the spring, trolling begins on waters such as West Grand Lake, Big Lake, and Pocumcus Lake. Grand Lake Stream itself is one of the most premier fly fishing streams for landlocked salmon in the country. ... In the region's northern reaches, smallmouth bass, lake trout and landlocked salmon of renowned Grand Lake area await the patient angler. The town of Grand Lake Stream, in its preserved Victorian splendor is home to a museum and more Registered Maine Guides per capita than anywhere else.<sup>12</sup>

Notably, there is no mention of the area within 8 miles of the proposed project.

**Maine Highlands.** The Maine Office of Tourism has this to say about the Maine Highlands Region.<sup>13</sup> "Here you can hike Maine's highest mountain or canoe Maine's largest lake. You can experience whitewater rafting one day, and enjoy a riverside concert the next. You can explore pristine wilderness or tour Stephen King's favorite haunts." The focus is on the Moosehead Lake and Baxter State Park. The official website of The Maine Highlands does not seem to reference the lakes within 8 miles of the proposed project.

This is admittedly a minimal investigation; normally an objective qualitative analysis for consideration in making a major decision would need to be more comprehensive. However, it does illustrate that with the DownEast & Acadia and Maine Highlands regions the potentially effected SRSNS are not being highlighted for their scenic value or as primary tourist destinations.

**4.4.3 Remoteness.** Remoteness is a landscape characteristic that LUPC has actively promoted and sought to protect. "The Commission has identified four principle values that, taken together, define the distinctive character of the jurisdiction," including:

Natural character, which includes the uniqueness of a vast forested area that is largely undeveloped and remote from population centers. Remoteness and the relative absence of development in large parts of the jurisdiction are perhaps the most distinctive of the jurisdiction's principal values, due mainly to their increasing rarity in the Northeastern United States. These values may be difficult to quantify but they are integral to the jurisdiction's identity and to its overall character" (LURC 2012, page 2).

In particular, remote lakes are prized:

The jurisdiction contains a diverse array of lakes, but the most highly treasured are its remote ponds—inaccessible, undeveloped lakes that offer a remote recreational experience which is not easily found in the Northeast (LURC 2012, page 38).

"Remote pond" is a land planning designation with a particular meaning. The "remote ponds" are identified by a Lake Management Class 6 designation. They are "inaccessible, undeveloped lakes with coldwater game fisheries. The Commission intends to continue to prohibit development within 1/2 mile of these ponds to protect the primitive recreational experience and

<sup>12</sup> [http://www.downeastacadia.com/region/way\\_downeast/](http://www.downeastacadia.com/region/way_downeast/)

<sup>13</sup> <http://www.visitmaine.com/region/highlands/>

cold water lake fisheries in remote settings” (LURC 2012, page C-10). In addition, the related Lake Management Class 1 protects the “highest value, least accessible, undeveloped lakes [that are not designated as remote] ... by prohibiting development within 1/4 mile of their shores and restricting permanent vehicular access to these lakes” (LURC 2012, page C-9).

Remoteness is also a key concept in the Recreation Opportunity Spectrum (ROS), which is a widely used recreation inventory and management tool originally developed for use by the US Forest Service (USDA 1982). A complementary tool was then developed for water resources, called the Water Recreation Opportunity Spectrum (WROS) (Haas et al. 2004); WROS has since evolved to become the Water and Land Recreation Opportunity Spectrum (WALROS) (Haas et al. 2011). However, these handbooks were all prepared for use primarily on public lands in the Western United States—a very different landscape and social setting than we have here in New England. Thomas More and other (2003) proposed revisions to ROS for nonfederal lands in the Northeast that focused on the fact that we live in a landscape with more roads and smaller ownerships, though the focus is still on public lands it might also apply to large conservation holdings or easements. More et al. (2003, Table 1, pages 12-13) describes five ROS land classes that are potentially relevant to the study area.

- **Primitive.** Area appears to be an essentially unmodified natural environment of relatively large size. It may contain evidence of past human activities and historical-cultural sites, but these are subordinate to its natural state. Interaction between users is very low, and evidence of other users is minimal. The area is essentially free from evidence of management restrictions and controls. Motorized or mechanized use is not permitted.
- **Semi-Primitive Non-Motorized.** Area appears to be a predominantly natural or natural appearing environment of relatively medium-to-large size. Interaction between users is low, but there is often evidence of other users. The area is managed so that minimum on-site controls and restrictions, if needed, are subtle. Non-mechanized uses predominate. Mechanized uses may be permitted. Motorized use is not permitted.
- **Semi-Primitive Motorized.** Area appears to be a predominantly medium-to-large size natural or natural appearing environment. Interaction between users is low, but there is often evidence of other users. The area is managed so that minimum on-site controls and restrictions, if needed, are subtle. Mechanized uses may be permitted.
- **Semi-Developed Natural** (aka Rural Natural). Area is a natural appearing environment. Evidences of the sights and sounds of people are moderate. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but evidence of other users is prevalent. Resource modification and utilization practices are evident but harmonize with the natural environment. Construction standards and facility design accommodate conventional motorized and mechanized uses..
- **Developed Natural** (aka Rural Developed). Area is a substantially modified natural environment. Resource modification and utilization practices enhance specific recreation activities and maintain vegetative cover and soil. Sights and sounds of people are readily evident. Interaction between users often is moderate to high. Many facilities are designed for use by a large number of people. Density levels decline with increasing distance from developed sites. Facilities often are provided for special activities. Facilities for intensified motorized and mechanized uses and parking are available.

Remoteness is a central criterion for identifying the ROS, WROS and WALROS land classes. I have considered LUPC's remoteness standard in the context of these management systems and identified the following thresholds for determining the following land classes:

- **Primitive (P)** areas are further than 2 miles from any road.
- **Semi-Primitive Non-Motorized (SPNM)** areas are between 0.5 and 2 miles from any road.
- **Semi-Primitive Motorized (SPM)** areas are within 0.5 mile of all private roads, which are assumed to be less well maintained and often not passable by a two-wheel drive vehicle.
- **Semi-Developed Natural (SDN)** (aka Rural Natural) areas are within 0.5 mile of public roads, which are assumed to be passable for a two-wheel drive vehicle.
- **Developed Natural (DN)** (aka Rural Developed) areas are also within 0.5 mile of public roads.

The result of applying these thresholds is shown on Map 6 Predicted Remoteness in Appendix 1.<sup>14</sup> The analysis did not identify a Primitive or Developed Natural (aka Rural Developed) areas. No portion of the study area is more than two miles from some sort of road access; therefore there are no Primitive areas. It may be that the more densely settled lakeshores could be considered Developed Natural areas are not distinguished from Semi- Developed Natural areas by their distance from public roads. There are small communities on Route 6 that would be in the Developed Natural class, such as Springfield. In addition, the more developed lakeshores would be the Semi-Developed Natural class, such as on Bottle Lake where much of the residential development that encircles the lake appears to be serviced by a private road. Table 7 identifies the ROS Class associated with the land surround each SRSNS based only on the Remoteness criterion. Where two classes are present, the one that appears to be secondary is placed in parentheses.

**Table 7. ROS Class based on Remoteness Criteria**

<b>SRSNS</b>	<b>ROS Remoteness Class<sup>†</sup></b>
Springfield Congregational Church	DN
Bottle Lake	SDN (SPM)
Duck Lake	SDN (SPM)
Horseshoe Lake	SPM
Junior Lake	SPM (SPNM)
Keg Lake	SPM (SDN)
Lombard Lake	SPM
Norway Lake	SPM
Pleasant Lake	SPM
Pug Lake/Junior Bay (West Grand Lake)	SPM

<sup>14</sup> Maine Office of GIS provided Maine DOT public roads data (medotpubrds.shp) and the Enhanced 911 database that includes private roads (e911Rds.shp) supplemented by an older database that had better coverage of logging roads (trans.shp).

Scraggly Lake	SPM
Shaw Lake	SPM
Sysladobsis Lake	SPM (SDN)
Upper Sysladobsis Lake	SPM
West Musquash Lake	SPM

Notes: DN = Developed Natural. SDN = Semi-Developed Natural. SPM = Semi-Primitive Motorized. SPNM = Semi-Primitive Non-Motorized. † If a secondary ROS class is present, it is listed in parentheses.

**4.4.4 Summary of Criterion B Character of surrounding area.** This response to considering Criterion B is an attempt to describe the condition as it is found. The area within 8 miles of the Bowers Wind Project turbines appears to be similar to much of the less developed areas of the state. It is typically scenic within the context of Maine, not spectacular. As such, a Medium rating will be assigned to all of the SRSNS. However, the primary importance of Criterion B in this analysis is to establish the context for making judgments about several of the other criteria.

#### 4.5 Criterion C: Typical viewer expectation.

A typical viewer's expectations concerning their use of a SRSNS may be influenced by the characteristics of the SRSNS and the role that scenery plays in their anticipated activities.

**4.5.1 Overall quality of experience expected today.** The Bowers intercept survey asked respondents to rate "what was the overall quality of experience you expected on your visit to \_\_\_\_\_ Lake today?" The scale ranged from use a scale of 1 for very low quality, 4 for neither high nor low quality, and 7 for very high quality. The results for the three lakes are presented in Table 8.

**Table 8. Bowers survey results for expected quality of experience.**

SRSNS	Mean	Std. Dev.	Count
Junior Lake	6.62	0.697	26
Pleasant Lake	6.68	0.541	31
Scraggly lake	6.54	0.878	13
All three lakes	6.63	0.663	70

Note: † Values are from the file BOWERS INTERCEPTS 10-03-12.xlsx (Stantec 2012).

Seventy-three percent of the respondents indicated that they expected a very high quality of experience, and no one indicated they expected a neutral or negative experience. These values suggest the respondents expect a very high quality of experience. This survey did not probe deeper for what it was that they expected would happen to make the experience so high quality. For these three lakes, the survey results suggest that the Criterion C rating should be High.

**4.5.2 ROS experience characterization.** If one accepts that the ROS classes identified using remoteness criteria are reasonable, then it is possible to describe the attributes that a SRSNS user could reasonably expect to experience. Following are excerpts from More et al. (2003) that characterize the potential experience (Table 2, pages 14-15) and evidence of humans (Table 5, pages 20-21) for each ROS class.

- **Primitive (P).** Extremely high probability of experiencing isolation from human development, use, and impact. ...Setting appears to be an essentially unmodified natural environment. Evidence of recent human activities would be unnoticed by an observer wandering through the area. ...Structures are extremely rare.
- **Semi-Primitive Non-Motorized (SPNM).** Moderately high probability of experiencing isolation from human development, use, and impact. ...Natural appearing setting may have subtle modifications that could be noticed but not draw the attention of an observer wandering through the area. ...Structures are rare and isolated.
- **Semi-Primitive Motorized (SPM).** Moderate probability of experiencing isolation from human development, use, and impact. ...Natural appearing setting may have moderately dominant alterations but would not draw the attention of motorized observers on trails and primitive roads within the area. ... Structures are rare and isolated.
- **Semi-Developed Natural (SDN) (aka Rural Natural).** About equal probability of encountering other user groups and isolation from sights and sounds of people. ...Natural appearing setting may have obvious modifications, ranging from easily noticed to strongly dominant. However these alterations remain unnoticed or visually subordinate from visually scenic and heavily traveled routes and use areas. ...Structures generally are scattered, remaining visually subordinate or unnoticed by observers on visually scenic or heavily traveled routes. Structures may include power lines, microwave installations, etc.
- **Developed Natural (DN) (aka Rural Developed).** Encounters with other individuals and groups are common. ... The physical setting is not as important as the activity opportunity. ...Natural appearing setting has been culturally modified so that the modifications are dominant. ... May include pastoral, agricultural, intensively managed wildland resource landscapes, or utility corridors. ...Structures are readily apparent and may range from scattered to small clusters that could dominate the landscape. Structures may include power lines, microwave installations, local ski areas, minor resorts, and recreation sites.

When in the Semi-Primitive and Semi-Developed areas, it is reasonable to expect a high degree of interaction with the natural environment. Users of Semi-Primitive areas can expect isolation from the sights and sounds of people; users of Semi-Developed areas are just as likely as not to encounter other users. However, these characterizations appear to be primarily from the perspective of a person experiencing the visual foreground (up to ½ mile in USDA 1995), not necessarily an area seen miles away.

Interpreting the experience of the ROS classes through the lens of the WEA, I suggest that when considering Criterion C, Primitive and Semi-Primitive Non-Motorized areas have a rating of High, Semi-Primitive Motorized and Semi-Developed Natural have a rating of Moderate, and Developed Natural and more urbanized areas have a rating of Low importance in determining the overall scenic impact.

**4.5.3 Summary of Criterion C expectations of the typical viewer.** The ratings for the two Criterion C indicators as well as the final rating are shown in Table 9.

**Table 9. Criterion C Expectations of the Typical Viewer Indicator and Final Ratings**

<b>SRSNS</b>	<b>Bowers Survey</b>	<b>ROS Class</b>	<b>Criterion C Rating</b>
Springfield Congregational Church	--	Low	Low
Bottle Lake	--	Medium	Medium
Duck Lake	--	Medium	Medium
Horseshoe Lake	--	Medium	Medium
Junior Lake	High	Med-High	Med-High
Keg Lake	--	Medium	Medium
Lombard Lake	--	Medium	Medium
Norway Lake	--	Medium	Medium
Pleasant Lake	High	Medium	Med-High
Pug Lake/Junior Bay (West Grand Lake)	--	Medium	Medium
Scraggly Lake	High	Medium	Med-High
Shaw Lake	--	Medium	Medium
Sysladobsis Lake	--	Medium	Medium
Upper Sysladobsis Lake	--	Medium	Medium
West Musquash Lake	--	Medium	Medium

#### **4.6 Criterion D: Development's purpose and context.**

One would not expect that a VIA would consider issues such as the changes that global warming will cause to the visible landscape unless a major shift to renewable energy sources is made immediately. Nor would it consider how productive and efficient wind energy projects are. These are outside the purview of a VIA. However, there are visual considerations that might be considered part of the development's purpose and context. For instance, will the project require extensive new associated facilities, such as access roads and power lines? Or the project may be proposed near other wind projects, thus concentrating the cumulative impacts to a few locations rather than spreading them evenly throughout the state.

**4.6.1 Limiting new associated facilities.** Limiting the need for new associated facilities will reduce the potential for scenic impacts. The Bowers wind project requires a 5.2 mile express collector line that joins Line 56, an existing 115kV generator lead line permitted for the Stetson I Wind project and also used by the Stetson II and Rollins Wind projects. The multiple use of such infrastructure increases their efficiency and decreases scenic impacts.

**4.6.2 Clustering projects.** There is some discussion about whether it is more desirable to distribute wind energy development throughout the state, or to cluster it in fewer areas. The thinking is that the greatest scenic impact occurs with the initial project, and that the incremental impact from additional projects is less than that initial impact.<sup>15</sup> Following this logic, the overall impact to the state's scenic resources will be lower if projects are clustered than if they are distributed evenly throughout the state. In a sense, identification of the expedited permit area is a movement in the direction of clustering. However, this approach does not offer guidance on

<sup>15</sup> Palmer (1999) demonstrated this phenomenon in a study of the scenic impacts associated with clearcutting.

determining when the cumulative scenic impact reaches an Unreasonably Adverse level, since the WEA criteria are only applied to each project's incremental impact.

The Cumulative Visual Impact Study Group (2012) considered approaches to manage or mitigate the cumulative impacts. An important starting point for their discussions was a paper prepared by LURC staff entitled *Cumulative Visual Impacts—Concepts & Issues* (CVISG 2012, appendix 2). In part it stated:

The LURC commissioners felt the best way to address CVI at the large landscape level is by clustering the development in “appropriate” locations and steering development away from “inappropriate” places. While site design, turbine design, color or other visual mitigation tools play a role in minimizing CVI, clustering is seen as the primary mechanism by which the cumulative effects of wind energy development on scenic resources across a large landscape (such as the existing expedited area) may be mitigated.

There appeared to be wide support for clustering from other stakeholders as well.

The Bowers VIA (LandWorks 2012) presents map of other wind projects in the region (Exhibit 21)—Stetson I and II, Rollins and Passadumkeag, illustrating that this region has become a *de facto* cluster. As such, the Bowers Wind project continues this trend.

**4.6.3 Summary of Criterion D: Development's purpose and context.** Two possible ways that a development's purpose and context might be relevant to conducting a VIA are proposed—limiting new associated facilities, and clustering. When applied to Bowers Wind, Criterion D indicates that the project will make a Low contribution to the overall scenic impact.

#### **4.7 Criterion E.1: Extent, nature and duration of uses.**

Consider the number of users, how they use of the resource, and their typical length of stay. User observations or surveys provide the most direct indicators, but trail logs or traffic counters are also be useful. Potential accessibility may be an indicator in the absence of empirical data.

**4.7.1 Extent of use.** Apparent ROS class may be used to determine the appropriate intensity of use (Hass et al. 2004, 2011; USDA 1982). These documents set the reasonable carrying capacity range for semi-primitive (SPNM and SPM) lakes to be between 110 and 480 acres per boat; on a semi-developed lake it is 50 to 110 boats per acre.

The number of boats at one time (BOAT) observed on the lake during the intercept survey periods. The range for boat carrying capacity and the observed mean and maximum BAOT are reported in Table 10. The average observed BAOT on these lakes is close to the higher end (fewer boats) of the carrying capacity range, while the maximum observed BAOT is in the middle of the range. It is assumed that the other lakes have a similar modest level of use for their ROS class (the one exception may be Bottle Lake which is very densely developed). Each lake will be given a rating of Low for extent of use, except for Bottle Lake, which is assumed to be Medium.

**Table 10. Boat Carrying Capacity and Observed Use**

Great Ponds	Area (acres) †	ROS Class	Carrying Capacity (# of boats)	Observed BAOT†
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			<b>Low</b>	<b>High</b>	<b>Mean</b>	<b>Maximum</b>
Junior Lake	4,000	SPM (SPNM)	36.4	8.3	7.3	20
Pleasant Lake	1,550	SPM	14.1	3.2	5.5	12
Scraggly Lake	1,641	SPM	14.9	3.4	3.0	10
Shaw Lake	251	SPM	2.3	0.5	0.0	0.0

Note: † Values are from the file BOWERS SPOT COUNTS 10-05-12.xlsx (Stantec 2012).

**4.7.2 Nature.** The nature of use concerns the recreation activities on the effected lakes. Again, the primary source of data is from the Bowers survey and the results are shown in Table 11. While fishing is the dominant primary activity, more than 9 in 10 of the respondents indicated that they planned on (1) enjoying scenery, (2) relaxing, and (3) observing wildlife. While this does not mean that scenery plays an important role in the fishing experience, it does appear that almost everyone who came to fish also plans on enjoying the scenery.

There were sufficient respondents who indicated that their primary activity was fishing (32% of respondents), that it is possible to test whether their perception of the change in scenic quality due to the Bowers Wind Project is significantly different from the perception of those who had another primary activity. The results indicate that it is not ( $F = 0.01$ ,  $df = 1, 68$ ,  $p = 0.914$ ). Similar results were obtained by looking at the results for each lake separately. This result might appear different than Palmer (1999) investigation of the relation of recreation activity and the perception of scenic impacts from clearcutting. In that study he found that people engaged in activities such as motor boating and snowmobiling or fishing and hunting were less sensitive to scenic impacts when compared to people who were camping and canoeing or studying nature. This difference may be because this sample had relatively few users in the campcraft and nature study categories.

The results of the Bowers survey suggest that scenery may play an important, but secondary role in the recreation experience of respondents. Therefore each lake will be given a rating of Medium for nature of use.

Table 11. Percent User Participation in Activities and Their Primary Activities

Activity	Junior Lake		Pleasant Lake		Scraggly Lake		Total	
	Engaged	Primary	Engaged	Primary	Engaged	Primary	Engaged	Primary
Enjoying/Viewing the scenery†	80.8	4.2	100.0	--	100.0	7.7	92.3	2.9
Relaxing	19.2	54.2	100.0	41.9	92.3	7.7	91.4	39.7
Observing wildlife or nature	80.8	--	96.8	--	100.0	7.7	91.4	1.5
Fishing from a boat or shore	100.0	29.2	77.4	29.0	84.6	46.2	87.1	32.4
Stargazing/enjoying the night sky	69.2	--	87.1	--	61.5	--	75.7	--
Motor boating	84.6	8.3	64.5	--	69.2	--	72.9	2.9
Camping	30.8	--	93.5	22.6	84.6	15.4	68.6	13.2
Staying at a camp	65.4	4.2	74.2	3.2	53.8	7.7	67.1	4.4
Swimming	65.4	--	54.8	--	69.2	--	61.4	--
Picnicking	61.5	--	54.8	--	76.9	--	61.4	--
Beach going/Using the beach	46.2	--	64.5	--	69.2	--	58.6	--
Sunbathing	46.2	--	35.5	--	53.8	--	42.9	--
Fish at night	38.5	--	29.0	--	23.1	--	31.4	--
Driving an ATV	30.8	--	35.5	--	23.1	--	31.4	--
Canoeing	46.2	--	16.1	--	38.5	--	31.4	--
Kayaking	42.3	--	25.8	--	15.4	--	30.0	--
Berry picking	26.9	--	12.9	--	15.4	--	18.6	--
Nature study	15.4	--	9.7	--	15.4	--	12.9	--
Personal watercraft	11.5	--	3.2	--	30.8	--	11.4	--
Staying at a lodge	0.0	--	12.9	--	15.4	--	8.6	--

Note: Values are from the file BOWERS INTERCEPTS 10-03-12.xlsx (Stantec 2012).

† Two questions were asked about scenery; the result reported here includes all those who responded yes to one of them.

**4.7.3 Duration.** Duration can refer to the length of time that a SRSNS user is engaged in recreation activities. It is reasonable to expect that a viewer who spends more time in an area with high potential visibility will be more impacted than someone who spends a very short time at a SRSNS (e.g., stopping at a scenic highway turnout). The influence that length of visit might have on scenic impact might be Low for a mean of less than half an hour, and High for greater than 4 hours.

Duration could also refer to the number of visits per year that a user makes to an SRSNS. In this case, the influence that number of visits might have on scenic impact might be Low for a mean of less than 2 per year, and High for greater than 7 per year.

The equally weighted combinatorial matrix shown in Figure 2 can be used to obtain a single rating for Duration.

**Length of visit.** The Bowers survey asked respondents “how long do you expect to visit the lake today?” (Kleinschmidt 2012a). The responses are in hours, ranging from 1 to 24, and include respondents who were interviewed both on the lake and on the shore. The average response is shown in Table 12 for each lake, as well as for the total sample. These results indicate that respondents are recreating for an average of 13 hours on lakes, and compared to other areas within 8 miles of the project, lakes have highest potential visibility of the project turbines. This would be in contrast to an SRSNS where viewers are normally inside a building without a view (e.g., the Springfield Congregational Church) or stopping for a short travel break.

**Table 12. Length of visit to the lake today in hours.**

SRSNS	Median	Mean	Std. Dev.	Count
Junior Lake	5.5	10.1	8.8	26
Pleasant Lake	16.0	15.5	8.9	31
Scraggly lake	8.0	13.5	8.9	13
All three lakes	10.0	13.1	9.1	70

Note: Values are from the file BOWERS INTERCEPTS 10-03-12.xlsx (Stantec 2012).

**Number of visits.** The Bowers survey asked respondents “During the past year, how many times have you visited \_\_\_ Lake?” (Kleinschmidt 2012a). The response rate was poor for this question, only 49 percent, and it did not include any of the first time visitors or most of the users who owned a home or camp on the lake. The results in Table 13 indicate that there are a few people who visit the lake very frequently—perhaps once a week—and then most people visit just a few times year.

**Table 13. Number of visits to the lake in the past year.**

SRSNS	Median	Mean	Std. Dev.	Count
Junior Lake	4.0	12.7	15.6	11
Pleasant Lake	1.5	11.3	20.4	16
Scraggly lake	4.0	7.0	6.8	7

All three lakes	4.0	10.9	10.9	34
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Note: Values are from the file BOWERS INTERCEPTS 10-03-12.xlsx (Stantec 2012).

Synthesis for duration. The equally weighted combinatorial matrix shown in Figure 2 can be used to obtain a single rating for Duration. Junior and Pleasant Lake are rated High, and Scraggly Lake is Medium-High. There is no information specific to the other lakes, so it is assumed that the duration of use will be similar to the average of the three surveyed lakes.

**4.7.5 Summary of Criterion E.1 extent, nature, duration of use.** The ratings for the Criterion E.1 indicators as well as the final rating are shown in Table 14.

**Table 14. Criterion E.1 Indicators and Final Ratings**

SRSNS	Extent	Nature	Duration	Criterion E.1 Rating
Springfield Congregational Church	--	--	--	--
Bottle Lake	Medium	Medium	High	Med-High
Duck Lake	Low	Medium	High	Medium
Horseshoe Lake	Low	Medium	High	Medium
Junior Lake	Low	Medium	High	Medium
Keg Lake	Low	Medium	High	Medium
Lombard Lake	Low	Medium	High	Medium
Norway Lake	Low	Medium	High	Medium
Pleasant Lake	Low	Medium	High	Medium
Pug Lake/Junior Bay (West Grand Lake)	Low	Medium	High	Medium
Scraggly Lake	Low	Medium	Med-High	Medium
Shaw Lake	Low	Medium	High	Medium
Sysladobsis Lake	Low	Medium	High	Medium
Upper Sysladobsis Lake	Low	Medium	High	Medium
West Musquash Lake	Low	Medium	High	Medium

#### **4.8 Criterion E.2: Effect on continued use and enjoyment.**

Criterion E.2 is “the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance.” There are two identified indicators, the effect of the scenic change on enjoyment and continued use. Intercept surveys are the most direct way to obtain data for these indicators. The survey can request respondents to consider the range in scenic quality throughout the state, and then using that range as a reference, respondents can rate the scenic quality of a viewpoint in a SRSNS. Next they can rate a photographic simulation of how the view will change if the wind project is constructed. Scenic change is the difference between the view with and without the project.

Similar questions can be asked about likelihood of returning and enjoyment of a SRSNS as represented by the before and after construction photographic simulations of a wind energy project. The difference between the simulated with and without visual conditions is the “effect” or change that the change has on enjoyment and continued use.

However, there are problems with this survey approach. First a decision maker has no information about the reliability of the results. Second the raw scores of this calculation are difficult to interpret. These two problems can be addressed by calculating the reliability coefficient for the ratings used to calculate the “effect,” and to employ effect size to report the result. Effect size has become the preferred way to report findings about change in the scientific literature (e.g., APA 2010).

**4.8.1 Reliability.** The first thing to consider is whether the respondents’ scenic ratings are reliable—that is if another survey is conducted in a similar manner, how confident should we be that the results would be the same. Reliability can range between 0 and 1. Nunnally (1978) states that reliability coefficients of 0.70 or 0.80 are normally acceptable for research purposes, but that reliability should be 0.90 or higher in situations where the measurements are the basis of important decisions.

Table 15 reports the reliability for individual respondents, as well as for the group of respondents using intraclass correlation coefficients (Palmer and Hoffman 2001). The individual reliabilities are quite low—they average 0.30 for the intercept surveys and 0.01 for the web survey. However, reliability can be improved by averaging the responses for a group of respondents; normally the more respondents, the higher the reliability. The group reliability for the intercept surveys is quite high (0.91), though the average for the web surveys is still rather low (0.44). In general, the ratings with and without the proposed project from each viewpoint are very reliable for the intercept surveys, though it may be necessary to survey more than 35 respondents to reach reliabilities of 0.90 or higher.

**Table 15. Reliability for scenic change and continued use ratings.**

SRSNS	Scenic Change			Continued use		
	Count	Individual Reliability	Group Reliability	Count	Individual Reliability	Group Reliability
Junior Lake	26	0.543	0.969	26	0.323	0.925
Pleasant Lake	30	0.419	0.956	31	0.271	0.920
Scraggly lake	13	0.709	0.969	13	0.269	0.827
All three lakes	70	0.517	0.987	70	0.311	0.969

*Note:* Values are from the file BOWERS INTERCEPTS 10-03-12.xlsx (Stantec 2012).

**4.8.2 Effect size.** The current best practice in scientific analysis and reporting is to use effect size as a way to report the strength of the relationship between the means of two variables measured on the same scale (e.g., APA 2010, p. 33). The statistic used in this analysis is Hedges’ (1985)  $g$ , which estimates the effect size based on the difference between means. Effect size is also comparable across all viewpoints because it is not affected by the rating scale.

Cohen (1988) suggested thresholds for interpreting the significance of a mean difference: a size effect of 0.2 is small, 0.5 is a medium effect, and 0.8 is a large effect. These thresholds have been found useful across a wide range of disciplines. Stamps (2000) has presented a powerful argument for using size effect to establish the importance of visual impacts. He reviewed “275

relevant studies, covering over 12,000 stimuli and more than 41,000 respondents” (Stamps 2000, page xi). Based on his findings, he has characterized effect sizes below 0.2 as being trivial or unnoticeable, at 0.2 there is a noticeable effect where the difference between better and worse is subtle and difficult to distinguish, while at 0.5 there is a significant effect where distinction becomes easy to determine, and at 0.8 there is a major effect where distinction is grossly perceptible. He also suggests adding an additional threshold at 1.1 to indicate when a visual impact would be very large “and likely to be controversial” (Stamps 2000, page 163-170).

Table 16 lists proposed effect size thresholds for evaluating Criterion E.2 indicators based on intercept surveys at SRSNS with potential visibility of a proposed wind energy project. This proposal is based on my reading of the literature and experience with the intercept studies conducted to date. However, it is presented for discussion purposes as we gain further experience with evaluating the impact of grid-scale wind development on scenic value and the use of SRSNS.

**Table 16. Proposed Effect Size Thresholds for Wind Energy Act Ratings**

Effect Size	Description	Rating
0.00 or higher	Positive	None
0.00 to -0.19	Not noticeable, Trivial	Low
-0.20 to -0.49	Small, Noticeable, Subtle	
-0.50 to -0.79	Medium, Significant	Medium
-0.80 to -1.09	Large, Major, Grossly perceptible	
-1.1 or lower	Very large, Controversial	High

**4.8.3 Scenic change.** The Bowers survey asked respondents to “think of an outdoor place in Maine that you would rate as having very high scenic quality or outstanding views and which—on a scale of 1 to 7—you would rate as a 7 for the highest scenic quality” (Kleinschmidt 2012a, question 12). A similar questions asked about “a very low scenic quality” view (question 14). These questions helped establish the extremes for rating the scenic value of the existing condition of the lake they are using (question 16) and how the same view will appear if the Bowers Wind Project is constructed (question 17). Respondents only evaluated a viewpoint from the lake they were using. The effect size for scenic change and the statistical parameters used to calculate it for each of the three lakes is given in Table 17. The results translate into High ratings for perceived scenic change.

**Table 17. Effect size for scenic change.**

	Junior Lake	Pleasant Lake	Scraggly Lake
<b>Pre-rating</b>			
Mean	5.615	6.200	6.000
Std. Dev.	1.061	0.961	0.913
Count	26	30	13
<b>Post-rating</b>			
Mean	2.846	4.1	2.385
Std. Dev.	2.257	2.234	2.103
Count	26	30	13
<b>Pooled Std. Dev.</b>	1.763	1.720	1.621
<b>Effect Size (Hedges g)</b>	-1.570	-1.221	-2.230

**4.8.4 Effect on enjoyment.** The Bowers survey asked respondents “Now I’d like you to think about how your enjoyment of visiting the lake would be affected if you were to see the proposed wind project during your visit today. On a scale of 1-7, where a 1 is a very negative effect, a 4 means that it would not change your enjoyment at all, and a 7 is a very positive effect on your enjoyment, how would your enjoyment be affected?” (Kleinschmidt 2012a, question 18). This question is phrased in such a way that the existing enjoyment, without the wind project, is assigned a value of 4, and the rating is for the effect of the change on their enjoyment. The effect size calculated from these data is the standard score and the same effect size thresholds are applied. The results translate into Low ratings for on Pleasant and Scraggly Lakes, but Medium on Junior Lake.

**Table 18. Effect size for effect on enjoyment.**

	Junior Lake	Pleasant Lake	Scraggly Lake
<b>Pre-rating</b>			
Mean (implicit)	4.000	4.000	4.000
<b>Post-rating</b>			
Mean	2.720	3.633	3.667
Std. Dev.	2.031	1.629	2.229
Count	25	30	12
<b>Effect Size (Std. score)</b>	-0.630	-0.225	-0.149

**4.8.5 Effect on continued use.** The Bowers survey asked respondents several questions about their activities on the lake, and then “On a scale of 1 to 7, where 1 is very unlikely, 7 is very likely, and 4 is neither unlikely nor likely, how likely is it that you will visit \_\_\_\_\_ Lake in the future?” (Kleinschmidt 2012a, question 11). After showing the respondents the photograph of the existing view and the simulated condition and asking for scenic value ratings, respondents are asked “Now I’d like you to think about your trip here today. Imagine the proposed wind project was built. On a scale of 1 to 7, where a 1 means you are very unlikely to return, a 4 means the change in view would have no effect on your return, and a 7 means you are very likely to return, how likely are you to return to \_\_\_\_\_ Lake given the presence of the wind turbines?” (Kleinschmidt 2012a, question 20). These questions are posed similar to the scenic value questions, they ask about continued use before and after construction of the Bowers Wind Project, and the effect size is calculated in the same manner as it is for scenic change. The effect size for continued use and the statistical parameters used to calculate it for each of the three lakes is given in Table 19. The results translate into Medium ratings.

**Table 19. Effect size for effect on continued use.**

	Junior Lake	Pleasant Lake	Scraggly Lake
<b>Pre-rating</b>			
Mean	6.885	6.774	6.923
Std. Dev.	0.431	1.087	0.277
Count	26	31	13
<b>Post-rating</b>			
Mean	5.115	5.300	5.308
Std. Dev.	2.422	2.020	2.394
Count	26	30	13
<b>Pooled Std. Dev.</b>	1.740	1.614	1.704
<b>Effect Size (Hedges g)</b>	-1.018	-0.913	-0.948

**4.7.5 Summary of Criterion E.2 Effect on enjoyment and continued use.** The ratings for the Criterion E.2 indicators as well as the final rating are shown in Table 20. Data are only available for Junior, Pleasant and Scraggly Lakes. Ratings for the other lakes are determined using these results, an inspection of the visual change represented in the simulations, and professional judgment informed by a systematic review of the previous intercept surveys conducted for wind energy projects in Maine.

**Table 20. Criterion E.2 Indicators and Final Ratings**

<b>SRSNS</b>	<b>Scenic change</b>	<b>Effect on Enjoyment</b>	<b>Continued Use</b>	<b>Criterion E.2 Rating</b>
Springfield Congregational Church	None	None	None	None
Bottle Lake	High	Low	Medium	Medium
Duck Lake	High	Low	Medium	Medium
Horseshoe Lake	None	None	None	None
Junior Lake	High	Medium	Medium	Medium
Keg Lake	High	Low	Medium	Medium
Lombard Lake	None	None	None	None
Norway Lake	None	None	None	None
Pleasant Lake	High	Low	Medium	Medium
Pug Lake/Junior Bay (West Grand Lake)	Low	Low	Low	Low
Scraggly Lake	High	Low	Medium	Medium
Shaw Lake	High	Low	Medium	Medium
Sysladobsis Lake	High	Low	Medium	Medium
Upper Sysladobsis Lake	None	None	None	None
West Musquash Lake	None	None	None	None

#### **4.9 Criterion F: Scope and scale of project views.**

The WEA states that:

A finding by the primary siting authority that the development's generating facilities are a highly visible feature in the landscape is not a solely sufficient basis for determination that an expedited wind energy project has an unreasonable adverse effect on the scenic character and existing uses related to scenic character of a scenic resource of state or national significance.<sup>16</sup>

However, visibility is clearly to be considered as part of Criterion F:

The scope and scale of the potential effect of views of the generating facilities on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance and the effect of prominent features of the development on the landscape.<sup>17</sup>

<sup>16</sup> 35-A MRSA, § 3452 sub-§ 3

<sup>17</sup> 35-A MRSA, § 3452 sub-§ 3(F)

**Visibility analysis.** In general blade tips alone are not sufficiently prominent from a distance greater than a couple of miles to be recognizable. At the distances between the SRSNS and the Bower Wind Project, visibility of the turbine hub and full blades is a better indicator. The visibility analysis used in this evaluation considers the screening effect of forest cover, assigning it a height of 40 feet. It is recognized that the trees in this area could be as high as 65 feet or more. However, based on the land cover data<sup>18</sup> available, it is safer<sup>19</sup> to use the lower value. The results of the visibility analysis are summarized in Table 21, which shows the percent of a SRSNS' area that has potential visibility of a certain number of turbine hubs. An example may help clarify how to read this table. Look at the row for Duck Lake. In the column for 16 turbine hubs, the value is 0—it is doubtful that a viewer would see 16 hubs from anywhere on Duck Lake. Moving to the right on the Duck Lake row, one finds that 14 turbine hubs may be visible from 4 percent of the lake. Continue along the row in the same manner reading the percent of the lake's area that will have visibility of the specified number of turbine hubs. At the right side of the table it shows that 64 percent of Duck Lake has potential visibility of at least one turbine hub, and 36 percent of the lake does not have visibility of any turbine hubs (though there may be blade tips that are visible).

There are re are 166,671 acres within 8 miles of the proposed wind turbines. Of these, 7,165 acres on SRSNS lakes have potential visibility of at least 1 turbine hub, which is approximate 4 percent of this study area. The area of the SRSNS lakes is 11,544 acres; there is potential visibility of at least one turbine hub from 62 percent of the SRSNS lakes. The average visible from somewhere on the SRSNS lakes, including those without any visibility, is 5.7 turbine hubs.

Criterion F identifies several indicators: the number of turbines visible, the extent of visibility from a SRSNS, the distance to turbines and the visual relationship between turbines and prominent landscape features.

#### **4.9.1 Number of turbine hubs visible within the 10<sup>th</sup>-percentile of the SRSNS's area.**

The first indicator sets thresholds based on the number of hubs that are visible from somewhere on the lake. Occasionally there is an anomalous small patch of very high visibility that cannot be properly explained. I therefore suggest that this indicator consider the number of turbines visible at the 10<sup>th</sup>-percentile of the SRSNS's area of maximum turbine visibility.

Based on my experience reviewing most of the VIAs and intercept surveys conducted for wind projects proposed in Maine, I propose the following thresholds shown in Figure 1; the results of applying these thresholds are presented in Table 22.

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<sup>18</sup> These are the same data used by the applicant. Accurate canopy data are available for purchase from third parties. For instance InterMap sells digital terrain and canopy surface data that in my experience are accurate to approximately 3 meters (<http://www.intermap.com/en-us/databases/nextmap.aspx>).

<sup>19</sup> By "safer" I mean that visibility may be over stated, but it is unlikely to be understated.

**Table 21. Percent of SRSNS with Visibility of Turbine Hubs**

SRSNS	Number of Turbines																
	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	Percent Area with Visibility																
Springfield Congregational Church	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
Bottle Lake	0	0	0	0	0	0	2	4	5	7	16	17	18	20	21	24	76
Duck Lake	0	0	3	5	6	9	18	25	29	35	52	54	57	59	61	64	36
Horseshoe Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
Junior Lake	0	0	0	1	5	10	36	44	55	64	75	78	81	82	84	86	14
Keg Lake	0	0	1	16	19	21	30	32	35	38	47	49	50	51	53	56	44
Lombard Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
Norway Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
Pleasant Lake	33	48	57	63	68	71	73	75	78	81	83	85	88	89	90	91	9
Pug Lake/Junior Bay	0	0	0	0	0	0	0	0	0	0	2	5	7	10	13	21	79
Scraggly Lake	2	8	18	25	33	37	44	50	55	59	66	69	72	74	76	79	21
Shaw Lake	0	5	11	22	27	31	38	41	45	52	56	61	65	72	78	80	20
Sysladobsis Lake	0	0	0	0	0	0	3	10	13	21	28	33	38	41	45	50	50
Upper Sysladobsis Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
West Musquash Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100

Note:

Number of turbine hubs	Indicator Rating
0	None
1-15	Low
16-30	Medium
Over 31	High

**Figure 3.** Rating thresholds for number of turbine hubs visible within the 10<sup>th</sup>-percentile of the SRSNS's area.

**Table 22.** Number of Turbine Hubs Visible within the 10<sup>th</sup>-Percentile of the SRSNS's Area and the Indicator Ratings for SRSNS Lakes.

SRSNS Lake	# Turbine Hubs	Rating
Bottle Lake	6	Low
Duck Lake	10	Low
Horseshoe Lake	0	None
Junior Lake	11	Low
Keg Lake	11	Low
Lombard Lake	0	None
Norway Lake	0	None
Pleasant Lake	16	Medium
Pug Lake/Junior Bay	0	None
Scraggly Lake	14	Low
Shaw Lake	14	Low
Sysladosis Lake	9	Low
Upper Sysladosis Lake	0	None
West Musquash Lake	0	None

**4.9.2 Percent of SRSNS with visibility of turbine hubs.** Another indicator for Criterion F is the percent of a SRSNS with potential visibility of at least one turbine hub. The analysis is based on the same data described above. The suggested thresholds for this indicator are given in Figure 4; the results of applying these thresholds are presented in Table 23.

Number of turbine hubs	Indicator Rating
0	None
1-33	Low
34-66	Medium
Over 67	High

**Figure 4.** Rating thresholds for percent of SRSNS with visibility of turbine hubs.

**Table 23.** Percent of SRSNS with Visibility of Turbine Hubs and the Indicator Ratings for SRSNS Lakes.

SRSNS Lake	% w/ Visibility	Rating
Bottle Lake	24	Low
Duck Lake	64	Medium
Horseshoe Lake	0	None
Junior Lake	86	High
Keg Lake	56	Medium
Lombard Lake	0	None
Norway Lake	0	None
Pleasant Lake	91	High
Pug Lake/Junior Bay	21	Low
Scraggly Lake	79	High
Shaw Lake	80	High
Sysladobsis Lake	50	Medium
Upper Sysladobsis Lake	0	None
West Musquash Lake	0	None

**4.9.3 Distance to nearest visible turbine hub.** The WEA has established that beyond 8 miles, the visual effect of wind projects is insignificant, or Low. Similarly, the WEA requires that a VIA be prepared for projects where SRSNS are within 3 miles of the turbines; setting this as the threshold for the High rating. When the closest visible turbine hub is between 3 and 8 miles the SRSNS is rated Medium for this indicator.

**Table 24.** Distance to Nearest Visible Turbine Hub and the Indicator Ratings for SRSNS Lakes.

SRSNS Lake	Distance (miles)	Rating
Bottle Lake	5.1	Medium
Duck Lake	2.7	High
Horseshoe Lake	None	None
Junior Lake	3.2	Medium
Keg Lake	3.7	Medium
Lombard Lake	None	None
Norway Lake	None	None
Pleasant Lake	2.4	High
Pug Lake/Junior Bay	7.7	Medium
Scraggly Lake	4.1	Medium
Shaw Lake	3.5	Medium
Sysladobsis Lake	6.3	Medium

Upper Sysladobsis Lake	None	None
West Musquash Lake	None	None

Note: These values are from the VIA (LandWorks 2012, Table 1, page 27).

**4.9.4 Visual relationship between the project and prominent landscape features.** Criterion B described the visible landscape character of the area surrounding the project. The most distinguishing feature of this area is the large number of lakes. However, these lakes are not visually prominent except when one is on them or their shore. In the case of the Bowers Wind Project, the effect related to this indicator is Low for all SRSNS with visibility of turbine hubs..

**4.9.5 Summary of Criterion F: Scope and scale of project views.** The ratings for the four Criterion F indicators are summarized in Table 25. Again, the general principle of giving each indicator equal weight is followed.

**Table 25. Criterion F Indicators and Final Ratings**

SRSNS	# Hubs Visible	% Lake Visibility	Nearest Turbine	Prominent Features	Criterion F Rating
Springfield Congregational Church	None	None	None	None	None
Bottle Lake	Low	Low	Medium	Low	Low
Duck Lake	Low	Medium	High	Low	Medium
Horseshoe Lake	None	None	None	None	None
Junior Lake	Low	High	Medium	Low	Medium
Keg Lake	Low	Medium	Medium	Low	Low-Med.
Lombard Lake	None	None	None	None	None
Norway Lake	None	None	None	None	None
Pleasant Lake	Medium	High	High	Low	High-Med.
Pug Lake/Junior Bay	None	Low	Medium	Low	Low
Scraggly Lake	Low	High	Medium	Low	Medium
Shaw Lake	Low	High	Medium	Low	Medium
Sysladobsis Lake	Low	Medium	Medium	Low	Low-Med.
Upper Sysladobsis Lake	None	None	None	None	None
West Musquash Lake	None	None	None	None	None

#### 4.10 Summary of Impacts

**4.10.1 Approach for determining Overall Scenic Impact.** There are two levels in determining Overall Scenic Impact; the first is for the individual SRSNSs, the second is the Total Scenic Impact to the area within 8 miles of the generation facilities.

**Overall Scenic Impact to individual SRSNS.** The following rules are used in this analysis.

1. If Criterion F indicates that there is no visibility of blade tips within 3 miles and a turbine hub within 8 miles of a generation facility, then the Overall Scenic Impact for the SRSNS is None.

4

2. There are three core criteria for determining the Overall Scenic Impact to individual SRSNS: E.1 Extent, Nature and Duration, E.2 Effect to Enjoyment and Continued Use, and F Scope and Scale. I propose to use the combinatorial matrix in Figure 5.

Criterion			Core Rating
E.1	E.2	F	
Low	Low	Low	Low
Low	Medium	Low	Low +
Low	High	Low	Medium –
Low	Low	Medium	Low +
Low	Medium	Medium	Medium –
Low	High	Medium	Medium
Low	Low	High	Medium –
Low	Medium	High	Medium
Low	High	High	Medium +
Medium	Low	Low	Low +
Medium	Medium	Low	Medium –
Medium	High	Low	Medium
Medium	Low	Medium	Medium –
Medium	Medium	Medium	Medium
Medium	High	Medium	Medium +
Medium	Low	High	Medium
Medium	Medium	High	Medium +
Medium	High	High	High –
High	Low	Low	Medium –
High	Medium	Low	Medium
High	High	Low	Medium +
High	Low	Medium	Medium
High	Medium	Medium	Medium +
High	High	Medium	High -
High	Low	High	Medium +
High	Medium	High	High –
High	High	High	High

**Figure 5. The equal weighted combination rules to obtain the rating for the core criteria.**

I recognize that the WEA does not differentiate among the 6 or 7 evaluation criteria. However, it is my professional expert judgment that these three form the core for determine the scenic impact to individual SRSNS.

3. If the core rating for an individual SRSNS receives a core rating of High – or High, then the three modifier Criteria are considered: A Significance, B Character of the Surrounding Area, and C Expectation of a Typical Viewer are to be considered. If any of

these three modifier criteria are High – or High, or if all three are Medium then the scenic impact is Unreasonably Adverse.

**Total Scenic Impact.** Even if no single SRSNS reaches the threshold of an Unreasonable Adverse scenic impact, it may still be possible that extensive Medium ratings warrant determining that the scenic impact from a project is Unreasonably Adverse.

4. I propose that if SRSNSs with ratings of Medium or higher comprise 10 percent of the area within 3 miles or 8 miles then the scenic impact is Unreasonably Adverse.

**4.10.2 Overall Scenic Impact of the Bowers Wind Project.** Table 27 summarizes the above findings from applying the scenic change evaluation criteria to the 15 SRSNS identified within 8 miles of the proposed Bowers Wind Project's turbines.

**Overall Scenic Impact to individual SRSNS.** The rules for determining the Overall Scenic Impact to individual SRSNS described above are applied to the ratings summarized in Table 27. And the results are presented in the last column, which reports the rating from the three core criteria. No SRSNS reaches the level of a High – or High Overall Scenic Impact. While the Bowers Wind Project is found to have an Adverse scenic impact, it does not reach the level of Unreasonably Adverse.

**Total Scenic Impact.** The accumulated effect of the Overall Scenic Impact to individual SRSNS is also investigated. Within 8 miles of the project generating facilities there are 8 SRSNS that received an Overall Scenic Impact of Medium or higher; they are listed with their area in Table 26. The total area is 9,022 acres, which is 4.3 percent of the 166,671 acres within 8 miles of the proposed wind turbines. This is below the recommended threshold, so again the Bowers Wind Project is found to have an Adverse scenic impact, it does not reach the level of Unreasonably Adverse.

**Table 26. The area of SRSNS with an Overall Scenic Impact of Medium or Greater.**

<b>Scenic Resources of State or National Significance</b>	<b>Overall Scenic Impact</b>	<b>Area (Acres)</b>
Bottle Lake	Medium	258
Duck Lake	Medium	262
Junior Lake	Medium	4,000
Keg Lake	Medium	371
Pleasant Lake	Medium	1,550
Scraggly Lake	Medium	1,641
Shaw Lake	Medium	251
Sysladobsis Lake	Medium	689

**Table 27. Summary of Evaluation Criteria Ratings for the Oakfield Wind Project**

Scenic Resources of State or National Significance	Scenic Impact Evaluation Criteria										Overall Scenic Impact				
	A	B	C	D	E.1	E.2	F								
<b>Historic Sites</b>															
Springfield Congregational Church	Low	Medium	Low	Low	--					None		None		None	None
<b>Great Ponds</b>															
Bottle Lake	Low	Medium	Medium	Low	Med-High					Medium		Low		Medium	Medium
Duck Lake	Low	Medium	Medium	Low	Medium					Medium		Medium		Medium	Medium
Horseshoe Lake	Low	Medium	Medium	Low	Medium					None		None		None	None
Junior Lake	Low-Med	Medium	Med-High	Low	Medium					Medium		Medium		Medium	Medium
Keg Lake	Low	Medium	Medium	Low	Medium					Medium		Low-Med.		Medium	Medium
Lombard Lake	Low-Med	Medium	Medium	Low	Medium					None		None		None	None
Norway Lake	Low-Med	Medium	Medium	Low	Medium					None		None		None	None
Pleasant Lake	Low-Med	Medium	Med-High	Low	Medium					Medium		High-Med.		Medium	Medium
Pug Lake/Junior Bay	Medium	Medium	Medium	Low	Medium					Low		Low		Low +	Low +
Scraggly Lake	Low-Med	Medium	Med-High	Low	Medium					Medium		Medium		Medium	Medium
Shaw Lake	Low-Med	Medium	Medium	Low	Medium					Medium		Medium		Medium	Medium
Sysladobsis Lake	Low-Med	Medium	Medium	Low	Medium					Medium		Low-Med.		Medium	Medium
Upper Sysladobsis Lake	Low-Med	Medium	Medium	Low	Medium					None		None		None	None
West Musquash Lake	Low-Med	Medium	Medium	Low	Medium					None		None		None	None

**Notes:** The Evaluation Criteria are: (A) Significance of resource, (B) Character of surrounding area, (C) Typical viewer expectation, (D) Development's purpose and context, (E.1) Extent, nature and duration of uses, (E.2) Effect on continued use and enjoyment, and (F) Scope and scale of project views.

\* This historic site is not listed on the National Register of Historic Places, and is therefore not a scenic resource of state or national significance as defined by the Wind Energy Act (§ 3451 (9)).

† The public does not have a legal right of access to these sites listed on the national Register of Historic Places, and therefore they are not scenic resources of state or national significance as defined by the Wind Energy Act (§ 3451 (9)).

## 5. Summary and Conclusions

This analysis has been conducted to demonstrate that it is possible to be more explicit about the indicators and thresholds used to implement the WEA criteria. Some of the analysis uses quantitative data, but qualitative data are also used. In order for readers to better follow the logic of my analysis, citations are given for references that have been used to inform the analysis. However, even with these attempts to create a more objective and reliable procedure for implementing the WEA criteria, I have exercised a substantial amount of professional judgment.

**Procedure for determining Overall Scenic Impact.** There is no clear procedure for determining the Overall Scenic Impact based on the criteria rating summarized in Table 27.

Within a criterion, I have been giving the various indicators equal weight and essentially doing arithmetic approximations as though the ratings were interval data. This procedure is not unusual for landscape assessments and has been found to work well in practice (e.g., McHarg 1969, Jones 1986, Parkin & Lortie 1989), however it is sometimes criticized as mathematically inappropriate.

It is clear that converting the ratings to numbers and simply averaging them is inadequate for synthesizing the ratings across criteria. For instance, Criterion F identifies those SRSNS that do not have any visibility of the project—clearly there is no scenic impact to them irrespective of the other criteria ratings. Criterion B is also of a different type—it largely describes the character of the project area to help establish a baseline for several indicators of other criteria. The Bowers Wind Project VIA also questioned how to use some of the criteria. For instance, concerning Criterion E.1, extent, nature and duration of use, it states (LandWorks 2012, p. 105):

Note that this criterion does not assess impact to scenic quality. A resource that receives low use (and subsequently a low rating for E1) but has high scenic quality, such as a remote pond, could still receive a high overall scenic impact rating based on contributions from other criteria. Likewise, a resource that has a high use (and subsequently a high rating for E1) but has low scenic quality due to shoreline development or other considerations could still receive a low overall scenic impact rating based on contributions from other criteria.

In another instance the applicability of including Criterion D, purpose and context of the proposed activity, in a VIA is questioned (LandWorks 29012, p. 36):

This criterion is not site-specific, but is a more general requirement that the agency consider state policy to encourage the siting of wind energy projects within the expedited permitting area when determining the reasonableness of the visual impacts.

One alternative approach to determine the Overall Scenic Impact to a SRSNS would be to assign it the highest of the criterion ratings. However, this also seems inappropriate to me. For instance imagine that all the criteria have Low ratings except Criterion C, expectations of the typical viewer, which has High rating. It would be inaccurate to say the scenic impact is High simply because expectations are high when it is also known that Criteria E and F are low. This suggests that some criteria may be more important than others in determining Overall Scenic Impact.

While there may not be a consensus yet in how to combine the criteria ratings, I believe that it is important to be as explicit as possible. If a project has visibility, then I have essentially treated the remaining criteria as being equally weighted and combined them based on a quasi-arithmetic approximation.

Similarly, it is unclear how to combine the Overall Scenic Impact rating for each SRSNS into a single determination for the project. One approach could be that if the Overall Scenic Impact for any SRSNS is High, then the impact of the project is Unreasonably Adverse. I am uncomfortable with this approach, in part because I do not consider all SRSNS to have equal weight. For instance even if there were many turbine hubs visible a couple miles away (Criterion F is High), it is not clear whether the Springfield Congregational Church passes the requirement that SRSNS “provide the public a legal right of access,”<sup>20</sup> and in any case the primary use of the facility is primarily indoors. This seems to be substantially different than the situation for Duck Lake where users have visibility of turbine hubs from over half of the surface area, yet Criterion F is Medium. In addition, it does not consider how the impact accumulates within the affected area within 8 miles of a project. Some projects have only one or two SRSNS, and they are of relatively minor scenic importance (for instance a stone wall corral made in Colonial times) while others have many SRSNS such as is the case for the Bowers project where there is visibility of at least one turbine hub from 62 percent of the surface area of the 14 SRSNS lakes—there is no visibility from some areas and up to 16 hubs may be seen from other, with an average 5.7 turbine hubs across the surface area for all the lakes. Even though none of the Overall Scenic Impacts ratings for the individual SRSNS are High, does this accumulated effect reach an Unreasonably Adverse level of scenic impact? The explicit procedures to make this determination have not been proposed, and no attempt at consensus has been attempted.

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<sup>20</sup> 35-A MRSA, § 3451 sub-§ 9

## 6. References

- American Psychological Association. 2010. *Publication Manual of the American Psychological Association*. (6<sup>th</sup> ed.) Washington, DC: APA.
- Cohen, Jacob. 1988. *Statistical Power Analysis for the Behavioral Sciences*. Second edition. New York: Psychology Press.
- Cumulative Visual Impact Study Group. 2012. Report of OEIS Assessment of Cumulative Visual Impacts from Wind Energy Development. Augusta, ME: Governor's Energy Office. <http://maine.gov/energy/pdf/Report%20of%20OEIS%20Assessment%20of%20Cumulative%20Visual%20Impacts%20from%20Wind%20Energy%20Development%20Mar2012.pdf> (Accessed February 21, 2013).
- ESRI. 2012. *ArcGIS 10.1*. Redlands, CA: ESRI.
- Expedited Permitting of Grid-Scale Wind Energy Development*. MRSA Title 35-A, Chapter 34-A. <http://www.mainelegislature.org/legis/statutes/35-A/title35-Ach34-A.pdf> (accessed February 23, 2010).
- Giffen, R. Alec, Drew O. Parkin, and Frederick W. Todd. 1987. *Maine Wildlands Lake Assessment*. Augusta, ME: Maine Department of Conservation, Land Use Regulation Commission. <http://www.maine.gov/doc/mfs/windpower/pubs/pdf/Maine%20Wildlands%20Lake%20Assessment.pdf> (Accessed February 11, 2011).
- Haas, Glenn, Robert Aukerman, Vernon Lovejoy, and Darrell Welch. 2004. *Water Recreation Opportunity Spectrum Users' Guidebook*. Lakewood, CO: USDI, Bureau of Reclamation. [http://www.usbr.gov/pmts/planning/wros/wros\\_report.pdf](http://www.usbr.gov/pmts/planning/wros/wros_report.pdf) (Accessed April 27, 2011).
- Haas, G., Aukerman, Grizzle, V., Jackson, J., 2011. *Water and Land Recreation Opportunity Spectrum Handbook*. 2nd Edition. United States Department of the Interior, Bureau of Reclamation, Program and Administration, Denver Federal Center, Denver, Colorado.
- Jones, Judy J. 1986. *Scenic Lakes Evaluation for the Unorganized Towns in Maine*. Augusta, ME: Maine Department of Conservation and Maine State Planning Office.
- Kleinschmidt. 2012a. Bowers Wind Project User Survey. Pittsfield, ME: Kleinschmidt. 40 pp. plus the questionnaire, graphs of results, and simulations.
- LandWorks. 2012. *Visual Impact Assessment for the Proposed Bowers Wind Project*. Middlebury, VT: LandWorks. 129 pp. plus maps, photo inventory, and visual simulations.
- McMahon, J.S. 1990. *The Biophysical Regions of Maine: Patterns in the Landscape and Vegetation*. M.S. Thesis. University of Maine, Orono.

- Maine, Department of Conservation, Bureau of Parks and Lands. 2009. *Maine State Comprehensive Outdoor Recreation Plan 2009-2014*.  
<http://www.maine.gov/doc/parks/programs/SCORP/contents.html> (accessed March 3, 2010).
- Maine, Department of Conservation, Land Use Regulation Commission. 2010. Comprehensive Land Use Plan. [http://www.maine.gov/doc/lupc/reference/clup/2010\\_CLUP.pdf](http://www.maine.gov/doc/lupc/reference/clup/2010_CLUP.pdf) (Accessed February 28, 2013).
- Maine, Department of Inland Fisheries and Wildlife. 2005. Appendix 7: Biophysical Regions of Maine. Maine's Comprehensive Wildlife Conservation Strategy.  
[http://www.maine.gov/ifw/wildlife/groups\\_programs/comprehensive\\_strategy/pdfs/appendix7.pdf](http://www.maine.gov/ifw/wildlife/groups_programs/comprehensive_strategy/pdfs/appendix7.pdf) (Accessed February 28, 2013).
- McHarg, Ian L. 1969. *Design with Nature*. Garden City, N.Y., Natural History Press. 197 p.
- More, Thomas A., Susan Bulmer, Linda Henzel, and Ann E. Mates. 2003. Extending the Recreation Opportunity Spectrum to nonfederal lands in the Northeast: an implementation guide. Gen. Tech. Rep. NE-309. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 25 p.
- Ode, Åsa, Mari Tveit and Gary Fry. 2008. Capturing visual character using indicators: Touching base with landscape aesthetic theory. *Landscape Research* 33(1): 89-117.
- Palmer, James F. 2000. Reliability of rating visible landscape qualities. *Landscape Journal* 19(1/2):166-178.
- Palmer, James F. 1999. Recreation participation and scenic value assessments of clearcuts. In *Proceedings of the 1998 Northeastern Recreation Research Symposium*, edited by H.G. Vogel song. Gen. Tech. Rep. NE-255. Radnor, PA: USDA, Forest Service, Northeastern Forest Research Station. pp. 199-203.
- Palmer, James F. and Robin E. Hoffman. 2001. Rating reliability and representation validity in scenic landscape assessments. *Landscape and Urban Planning* 54(1-4):149-161.
- Palmer, J., and J. Roos-Klein Lankhorst. 1998. Evaluating visible spatial diversity in the landscape. *Landscape and Urban Planning* 43(1-3): 65-78.
- Parkin, Drew, John Lortie, Robert Humphrey, and Fred DiBello. 1989. *Maine's Finest Lakes: Results of the Maine Lakes Study*. Augusta, ME: Maine Critical Areas Program, State Planning Office.
- Parkin, Drew, and John Lortie. 1989. *Scenic Lakes Evaluation for the Organized Towns in Maine*. Augusta, ME: Maine Critical Areas Program, State Planning Office.

Stamps, Authur E. 2000. *Psychology and the Aesthetics of the Built Environment*. Boston: Kluwer Academic Publishers.

Stantec Consulting. 2012. *Bowers Wind Project Response to Palmer Data Request*. December 12, 2012. CD-ROM.  
<http://www.maine.gov/doc/lurc/projects/Windpower/FirstWind/Champlain/Development/Application/Narrative.pdf> (Accessed April 22, 2011).

Tveit, Mari, Åsa Ode, and Gary Fry. 2006. Key concepts in a framework for analyzing visual landscape character. *Landscape Research* 31(3): 229-255.

USDA, Forest Service. 1995. [page revisions 2000] *Landscape Aesthetics: A Handbook for Scenery Management*. Agricultural Handbook Number 701.  
<http://www.esf.edu/es/via/> (accessed March 11, 2010).

USDA, Forest Service. 1982. *ROS User's Guide*.  
[http://www.fs.fed.us/cdt/carrying\\_capacity/rosguide\\_1982.pdf](http://www.fs.fed.us/cdt/carrying_capacity/rosguide_1982.pdf) (accessed June 3, 2011).

USGS. 2009a. *National Elevation Dataset (NED)*.  
[http://eros.usgs.gov/#/Find\\_Data/Products\\_and\\_Data\\_Available/NED](http://eros.usgs.gov/#/Find_Data/Products_and_Data_Available/NED) (accessed April 26, 2010).

USGS. 2009b. *Vertical Accuracy of the National Elevation Dataset*.  
[http://ned.usgs.gov/downloads/documents/NED\\_Accuracy.pdf](http://ned.usgs.gov/downloads/documents/NED_Accuracy.pdf) (accessed April 26, 2010).

# Appendix 1

## Review Maps

Map 1: Topographic Viewshed for Blade Tip

Map 2: Forested Viewshed for Blade Tip

Map 3: Topographic Viewshed for Turbine Hub

Map 4: Forested Viewshed for Turbine Hub

Visibility analysis determines whether a line-of-sight exists between two specified points. A geographic information system (GIS) is used to map the viewsheds from which the Bowers' Wind Project's turbines are potentially visible. In principle this is an objective exercise in geometry highly suited to a computer application. In practice however, since the data are only approximations of the actual condition and may include errors and assumptions, the resulting viewshed maps are best considered a preliminary analysis of potential visibility under specified conditions. The maps are useful for providing a preliminary investigation of the overall potential visual impact. If potential visual impacts appear to exist for significant scenic resources, they need to be confirmed through field investigation and other visualization techniques.

Map 5: Major Local Landforms

Map 6: Predicted Remoteness



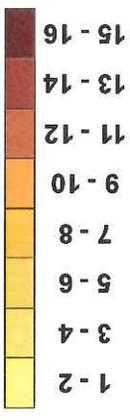
# Map 2 Forested Viewshed for Blade Tip Bowers Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

## Legend

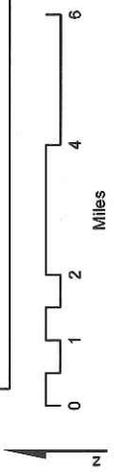
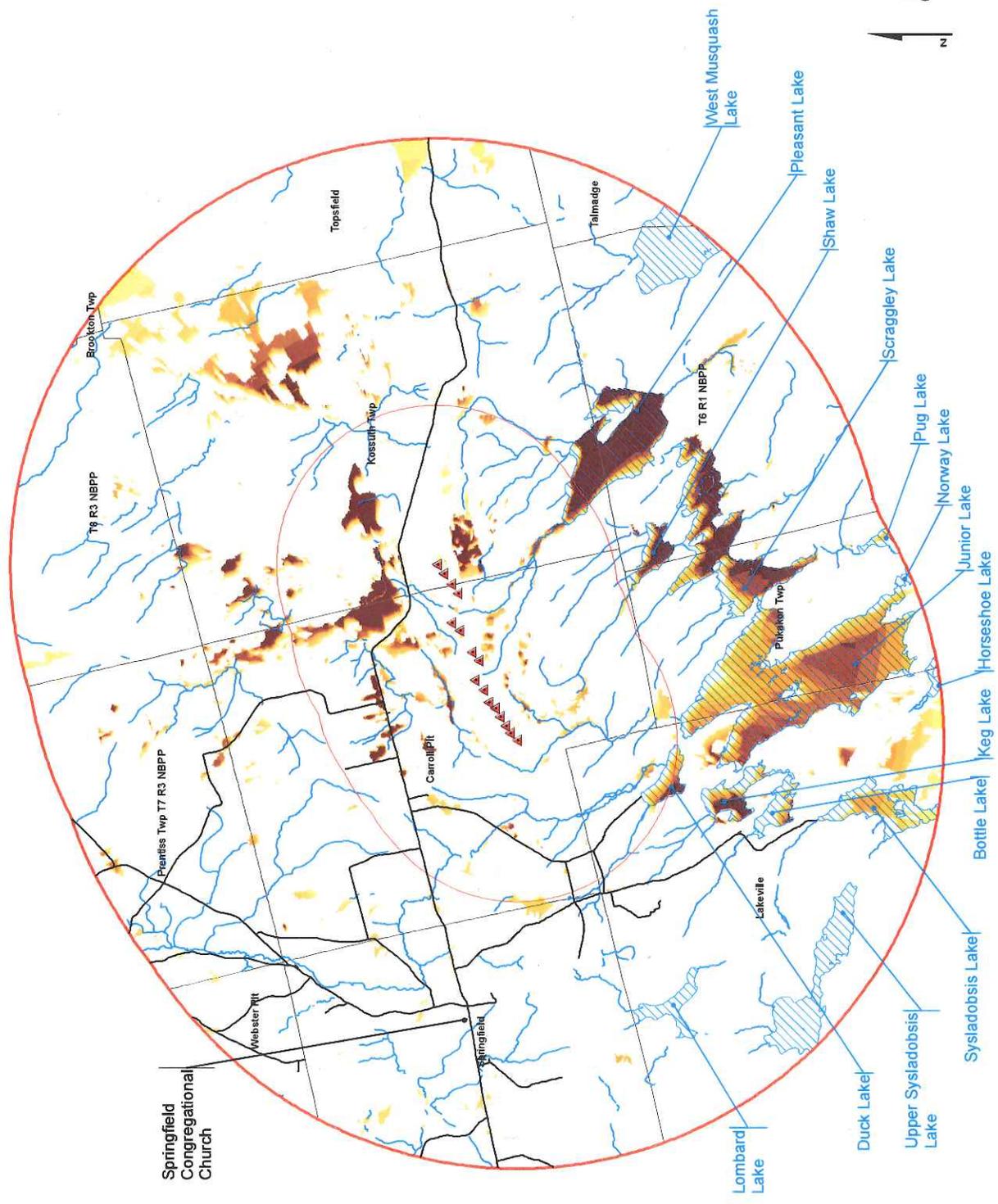
▲ Turbine Locations

Number Visible



Scenic Resources of State or National Significance

- Great Ponds
- National Register of Historic Places



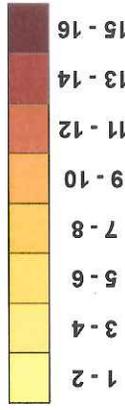
# Map 3 Topographic Viewshed for Turbine Hub Bowers Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

## Legend

▲ Turbine Locations

Number Visible

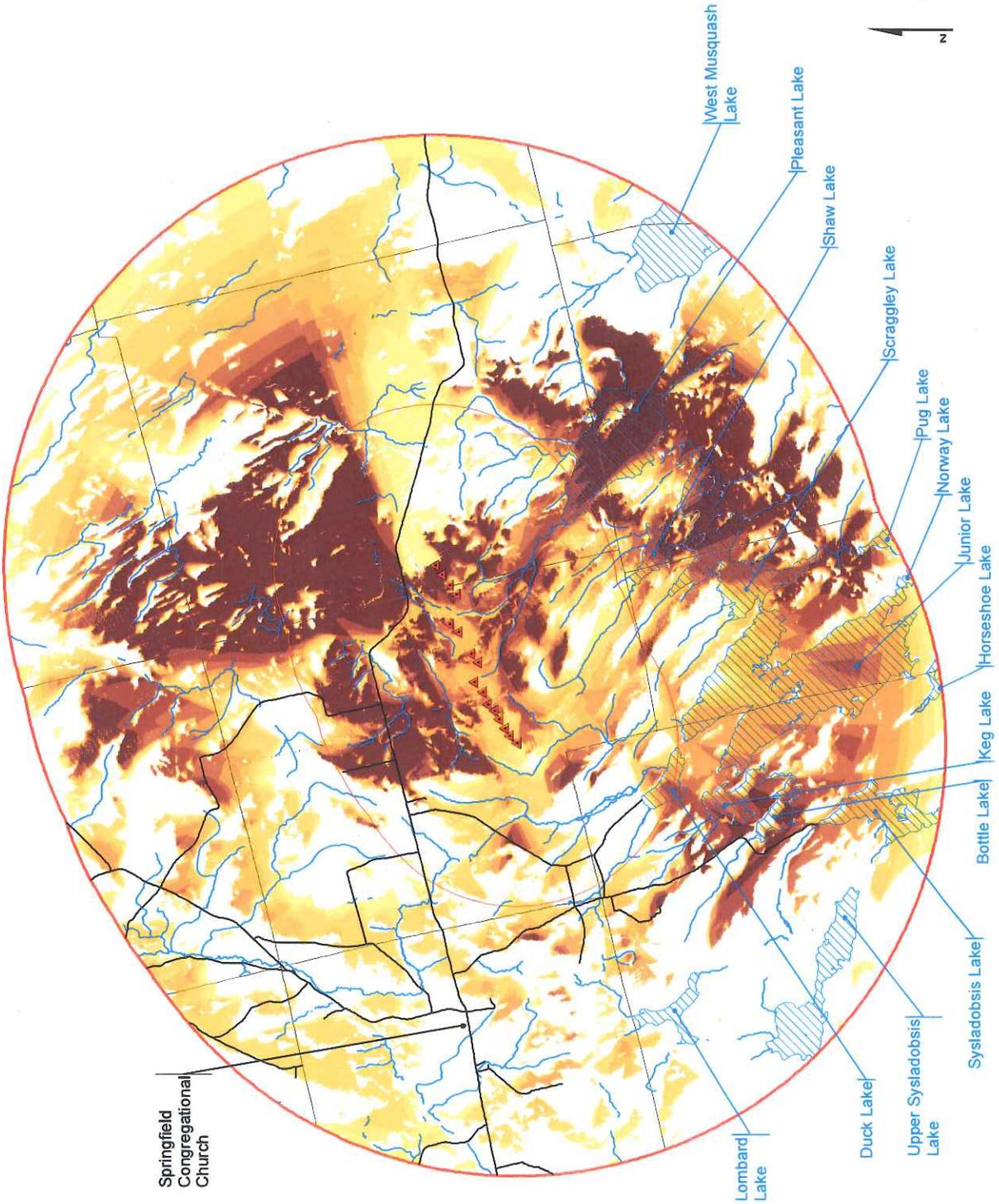


Scenic Resources of State or National Significance

— Great Ponds

— National Register of Historic Places

1186



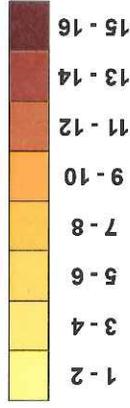
# Map 4 Forested Viewshed for Turbine Hub Bowers Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

## Legend

▲ Turbine Locations

Number Visible

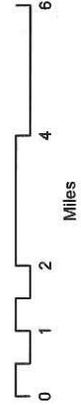
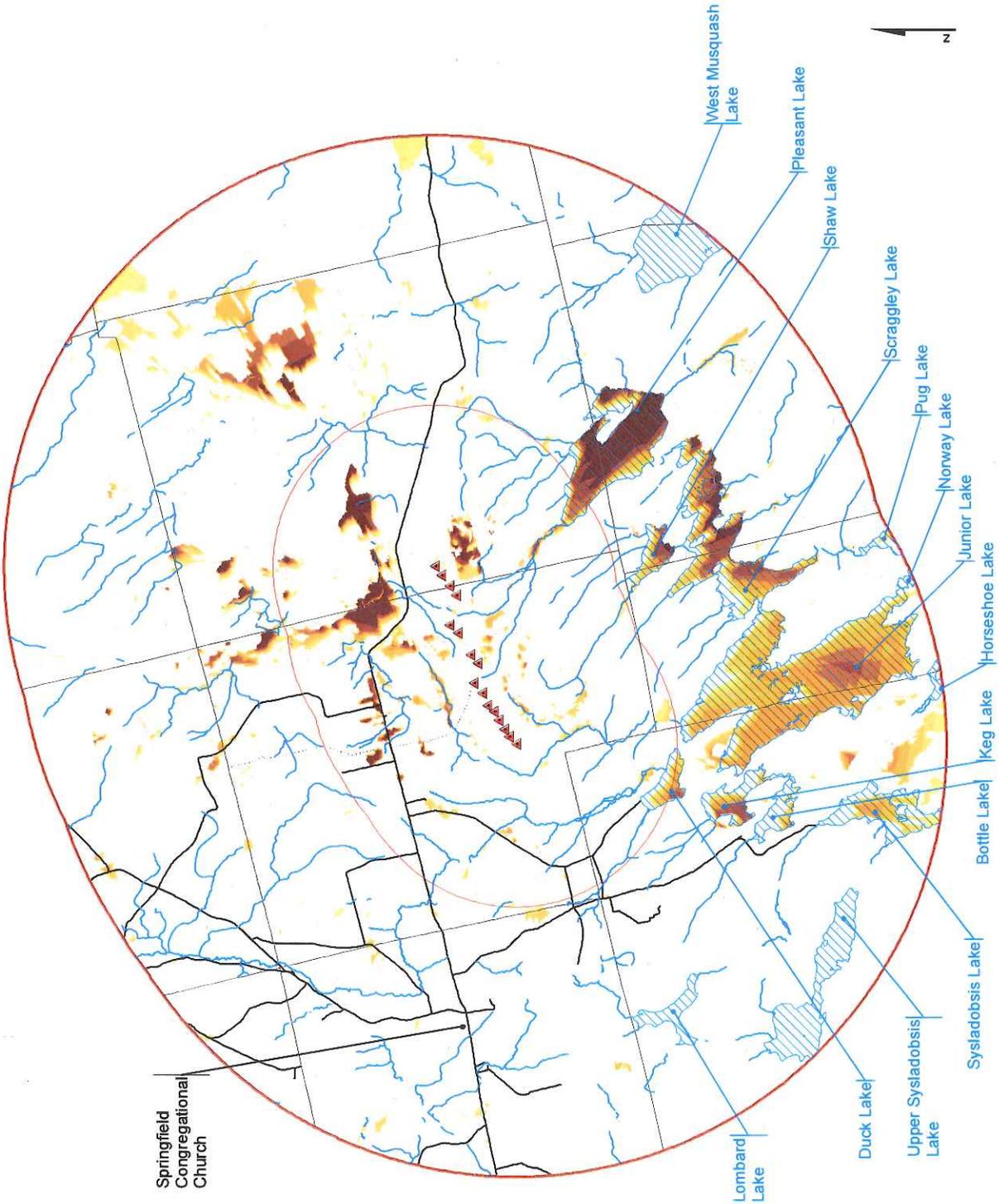


Scenic Resources of State or National Significance

— Great Ponds

— National Register of Historic Places

1187



# Map 5 Significant Local Landforms

## Bowers Wind Project

Higher landforms are a major structural element of the landscape. They provide distinctive character and often serve as landmarks. This map portrays 40-foot landform contours beginning at 660 feet.

### Legend

— 40' Contours over 660'

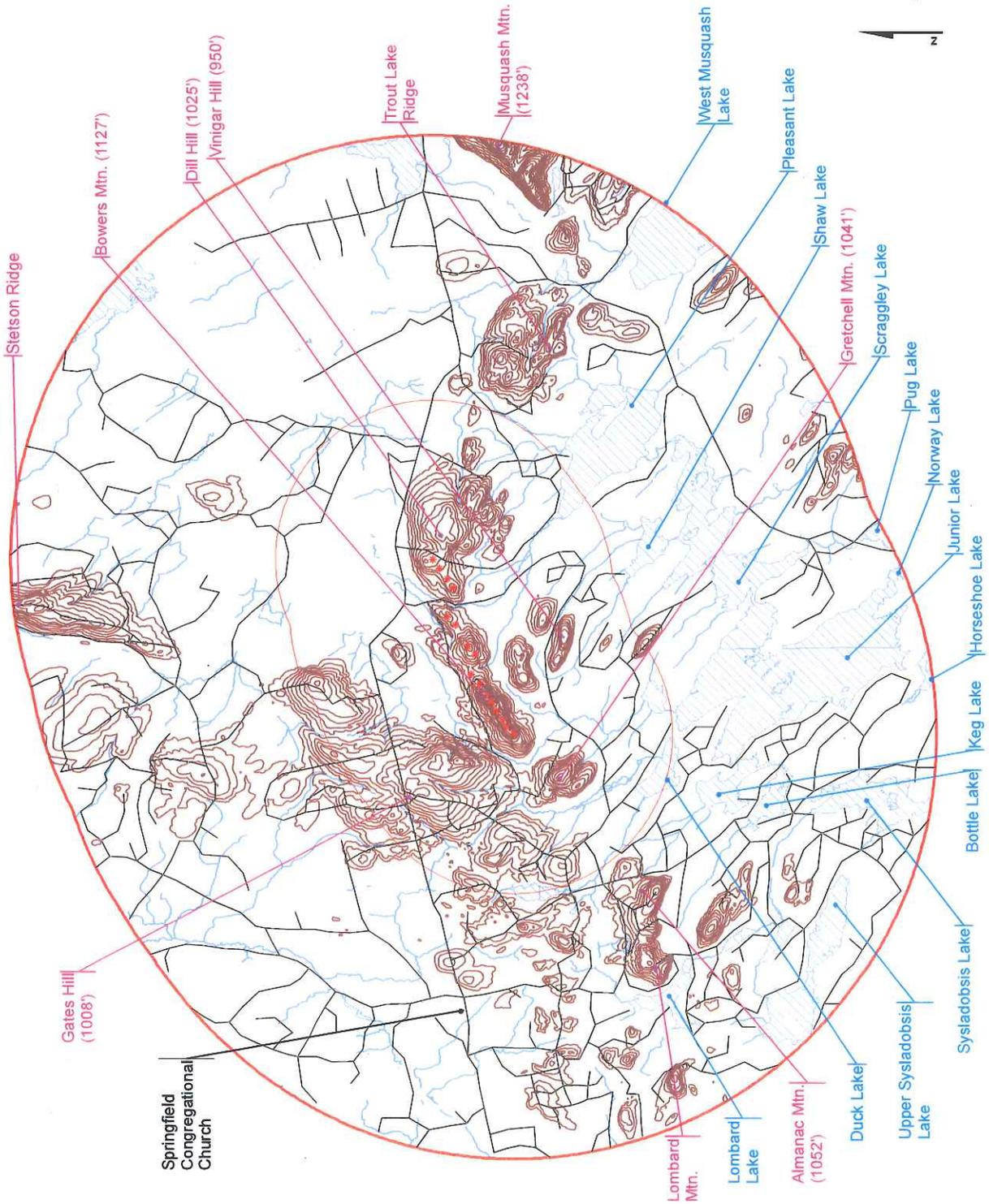
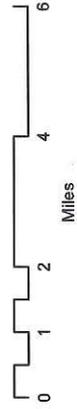
### Major Local Peaks

Major Local Peak  
(elevation in feet)

### Scenic Resources of State or National Significance

Great Ponds

National Register  
of Historic Places



# Map 6 Predicted Remoteness Bowers Wind Project

The degree of remoteness is an important attribute for defining Maine's landscape character. Specifically, the Land Use Planning Commission has defined remote ponds as being at least 0.5 miles from any road accessible to a two-wheel drive vehicle.

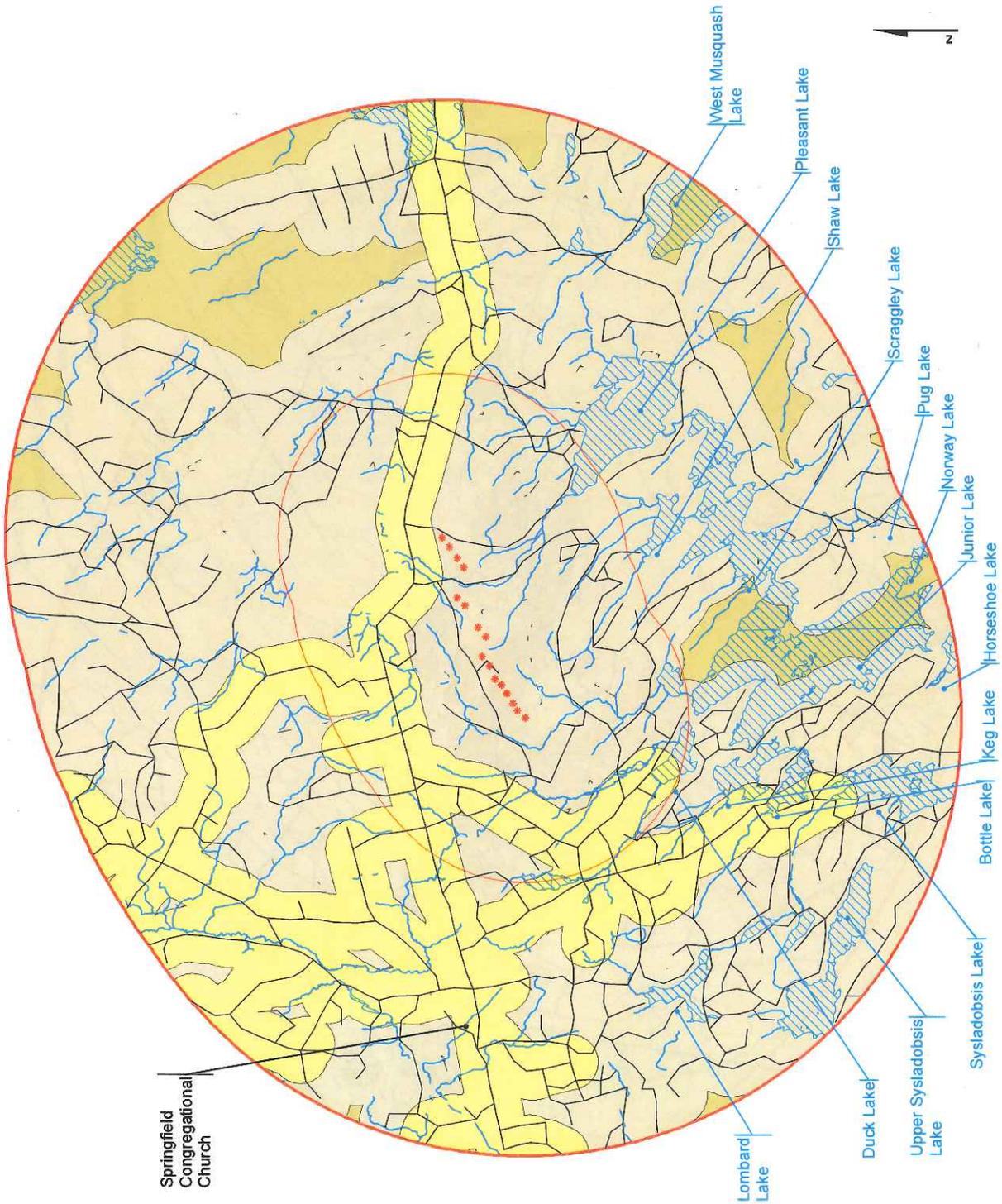
In this analysis, Semi-Developed Natural refers to areas within 0.5 miles of a maintained public road. Semi-Primitive Motorized areas are within 0.5 miles of other roads. Semi-Primitive Non-motorized areas are within 2 miles but further than 0.5 miles of a road.

## Legend

- Semi\_Developed
- Semi\_Primitive\_Motorized
- Semi\_Primitive\_Nonmotorized

## Scenic Resources of State or National Significance

- Great Ponds
- National Register of Historic Places



Springfield  
Congregational  
Church

Memoranda from James Palmer to Jessica Damon (DEP)

# memo

To: Jessica Damon

From: James F. Palmer

Date: 17 January 2013

RE: Questions about the Bowers and Baskahegan User Surveys, and Kevin Boyle's Expert Report

I have read the *Bowers Wind Project User Surveys* and *Baskahegan Lake User Surveys*, prepared by Kleinschmidt, and the *Expert Report of Kevin J. Boyle, PhD*. In addition, I have conducted an initial review of the data from the two user surveys. In this memo I provide a list of comments and questions for which I would appreciate clarification, much like I would for a scholarly journal peer review. These sort of critical questions are the time honored way in which scientific and technical work is vetted and knowledge is advanced. My hope is that this will provide the applicant additional time to respond. I will follow this memo with a more formal review that will include my own analysis.

I want to make it clear that in posing these questions I am not questioning the overall quality of these reports or the qualifications of their authors. Both authors have strong professional credentials, and the two user surveys appear to be conducted according to best professional practices for recreation surveys. Rather questions such as these are always raised from a close reading of technical material.

## **BOWERS USER SURVEY**

1. Can estimates of the "extent and duration" of SRSNS usage be based on the boat counts and the survey results, as required by Criterion E? Could you suggest standardized questions and a process to analyze them for this purpose?
2. How does the usage of the studied lakes compare to other SRSNS and recreational resources in the Downeast Lakes region and state? Throughout the VIA there are references to "low use" of the SRSNS, but this vague term is not defined or placed in context; perhaps the survey data could be used to correct that?
3. While no one was observed on Shaw Lake during three observation periods, 15% of the Baskahegan survey respondents indicated that they had visited Shaw Lake. Given this response, what might you estimate is the usage of Shaw Lake?
4. The VIA produces maps showing which areas on the lakes have the highest opportunity for views of turbines. However, there is no information about where existing users are typically found on the lake. Based on the boat observation data, the interview GPS data (Figure 9, page 23), and the

response to question 7 (where users indicate on a map where they have been) can you identify areas of high, medium and low use on the three surveyed lakes?

5. Thinking about the usage pattern on Junior Lake, does it appear that users are more likely found along the southern and western portions of the Junior Lake? The VIA states on page 70 that: "Although a considerable portion of the lake has potential visibility of the project, there are a number of areas that provide visual isolation, including the northern and eastern shorelines and the many islands on this lake." If one assumes that people are purposefully using the lake, is it not reasonable to conclude that requiring users to shift from the area they have used in the past to another area of the lake in order to avoid views of wind turbines would affect their enjoyment?
6. Why were people interviewed on the land, since this is not part of the SRSNS?
7. Instruction 5 on page 19 is unclear whether the interviewer attempted to complete interviews with everyone in a group or whether there was just one interview per boat. Could you please clarify this?
8. The results indicate that 283 people were observed at Pleasant Lake, 158 at Junior Lake and 90 at Scraggly. However, this adds up to 531 people observed, rather than the 486 stated on page 21. Please reconcile this contradiction.
9. Understanding the importance of the "viewing scenery" for users of different activities would seem to be necessary to properly respond to Criterion E. If one were to cross the respondents primary activity on the lake with whether they were also "viewing scenery" it becomes apparent that viewing scenery is usually a secondary part of all the other activities. Would you agree with this observation?
10. The VIA states on page 34 and elsewhere that: "there is some evidence that scenic quality is less important to people engaged in fishing and motor boating as opposed to hiking and paddling." Are you aware of research that supports this contention; if so please cite it? Do the survey results support this contention?
11. The question that addresses how the visual change will affect the user's continued use appears to have changed over time. The question asked for the Saddleback Ridge Wind Project was: "On a scale of 1-7 where 7 means you are more likely to return and 1 means you are less likely to return... [and] a '4' means the change in the view would have no effect on your return." However, question 20 on the Bowers survey is: "On a scale of 1 to 7, where a 1 means you are very unlikely to return, a 4 means the change in view would have no effect on your return, and a 7 means you are very likely to return, how likely are you to return." Emphasis is added to highlight the change from more or less likely to very likely or unlikely.

Assume that I am a long time user of Junior Lake who is on the water at least once a week during fishing season (30 or more time a year) and scenic value has nothing to do with why I am on the lake. Using the earlier form of the question, I would respond that it has no effect—I will neither be more nor less likely to return. However, I would be uncertain of how to respond to the question as

stated on the Bowers survey—it will have no effect (i.e., 4) but I am also “very likely to return” (7). Based on this example, would you agree that there could be confusion about how to properly respond to question 20 on the Bowers survey?

12. Kevin Boyle summarizes the results for the continued use question across the various intercept surveys. The results for the Bowers survey show that 61% of respondents are likely to return even though their perception of the scenic impact is among the most negative of any study. In contrast, the highest level among the other surveys is 27% and the average is 11%. Might the apparent anomaly of very negative perceived scenic impact have the effect of high likelihood of continued use be because of how question 20 was worded?
13. What levels of scenic impact ratings (tables 11, 12 and 13), effect on enjoyment (tables 14 and 16) and likelihood of returning (tables 17, 19 and 20) would cross the threshold from simply Adverse to Unreasonable Adverse? How would you identify that threshold?
14. In the discussion section on page 39, it states that: “Overall, results indicate that conditions represented in the photographic simulation result in lower scenic ratings, but respondents will continue to enjoy recreation in and return to the study area.” How is this reconciled with table 14, which shows 31% of respondents indicating that the project would have a very negative effect on their enjoyment? To assert that this is the result of “negative publicity and outreach by PPD/LW” (p. 13 of Boyle’s report) may be true, but it does not change that it is the respondents’ reaction. Is there another reason that reconciles this concluding statement and the survey results?

#### **BASKAHEGAN USER SURVEY**

1. This survey was conducted at the Baskahegan boat launch, which has a clear view of the Stetson Wind Project over 9.3 miles away. Is it not reasonable to assume that this particular view will have a dominant effect on the survey responses since it is what is visible when the questions are being asked? Therefore, is it not reasonable to interpret the survey results as demonstrating that the Wind Energy Act (WEA) was correct in stating the scenic impact beyond 8 miles is “insignificant”?
2. Is it not possible, even probable, that most users of Baskahegan Lake who strongly object to the scenic impact of the Stetson project have simply gone elsewhere and therefore were not surveyed? How would one design a survey to correct for this problem?
3. At the top of page 13 it states an average of 15 people were observed in an interview period, yet Table 2 states that it is 12 people. Please reconcile this?
4. On December 4, 2012 I requested the full text for the open ended questions. On January 4, 2013 Marty Phillips replied that the Excel spreadsheet BASKAHEGAN INTERCEPT DATA 10-03-12.xls, provided on November 15, 2012 contained these data. It stretches credibility that 10 of 26 people responding to question 8 would use exactly the same words—“Like the Lake/Area.” I want to know what “Like the Lake/Area” means, and particularly if there is a scenic component. I do not know of

another way to do this than to look at the open ended data (Q8, Q11, Q14, and Q17). I would still like it provided to me.

5. It is unfortunate that the Baskahegan survey only collected post-construction data. As a result it is not possible to evaluate how construction of the Stetson Wind Project affected use of the lake or the perception of scenic value. Similarly, it is unfortunate that the Baskahegan study did not seize the opportunity to test the validity of photographs to represent the scenic impacts of grid-scale wind projects. Would you not agree that pre- and post-construction surveys provide a much more robust research design for responding to the WEA's evaluation criteria?

#### **EXPERT REPORT BY BOYLE**

1. The executive summary states that: "the Bowers Mountain wind farm is not going to have a significant adverse impact on recreational use and enjoyment of lakes within eight miles of the project." Yet table 2 on page 8 states that 60% of those interviewed on Junior Lake indicated that the simulated conditions would have a negative effect on enjoyment. If having a negative impact on the experience of 60% of the Junior Lake respondents is not "significant," then where is that threshold located?
2. The executive summary states that: "while users of Junior, Pleasant and Scraggly Lakes may fear the impact of the Bowers wind farm on scenic quality, this is just a fear." This may be true, but perhaps their fear is justified. What reasonable basis is there to dismiss their fear as unjustified? Is it not just as reasonable for opponents to respond that you hope there will be little impact, but it is just hope?
3. The Bowers survey interviewed users of SRSNS, the specific public group that has standing in the WEA. They were shown accurate visual simulations and instructed how to view them so that the visual magnitude of the turbines was appropriate. What would you change to increase the validity and reliability of the survey and its utility for responding to the WEA criteria?
4. The executive summary states that: "there is convincing evidence that the existing Stetson wind farm has not reduced scenic quality of nearby Baskahegan Lake nor has it reduced the quality of recreation experiences or recreational use." Where is this convincing evidence? The Baskahegan survey only asked about the current experience of respondents; evidence of change would require a pre-construction survey. If this convincing evidence is the in-depth interviews with frequent Baskahegan watershed users, then explain why retrospective data from 6 individuals who were not ask about the Stetson Wind Project provides "convincing evidence"?
5. Rather than simply assert on page 9 that "The sample sizes for Junior and Pleasant Lakes are sufficient to have confidence in the statistics," would it not be more appropriate to report the 95%-confidence intervals?
6. What is meant on page 9 by the phrase "not an objective evaluation"? Are not all the scenic ratings subjective evaluations? I understood the intercept surveys to be an objective process that measures a subjective phenomenon. Do you see it differently?

7. I do not understand the meaning of the sentence on page 9: "These ratings help to identify the opposition bias in the scenic value ratings because larger percentages of respondents at each lake indicate the wind farm will have no effect or positive effect than those who rate the scenic value as high, 33% versus 55% overall." Please explain how these results "identify oppositional bias." In general, the other intercept surveys' size effects (e.g., Cohen's  $d$  or Hedges'  $g$ ) have shown that the scenic impact is very high, its effect on enjoyment is moderate, and there is only a small effect on continued use. Do you interpret the results from the Bowers and other intercept surveys differently? If so, what is the basis of that different interpretation?
8. On page 10 it states that "one additional lake is within eight miles...Shaw Lake." Actually there are nine Great Ponds within eight miles of the Bowers Wind Project that have potential visibility of the turbines, not just the four Kleinschmidt surveyed.
9. On page 10 it states that "I believe preferences of Shaw Lake users would be most like those of Pleasant Lake users." Why would this be so—Pleasant Lake is a large lake with public access at two places, while Shaw Lake is small with no access. Would not the ease of access be more important than geographic proximity? Would you not expect the types of users on these two lakes to have very different motivations and expectations?
10. On page 11 it states that "I believe that this bifurcation between expected positive effects and expected negative effects is a consequence of the significant negative publicity and outreach that occurred during the public review process on the original Bowers project proposal and that continues today." The Rollins Wind (40 turbines) and Stetson Wind (55 turbines) projects have been operational for sufficient time that it is likely most of those interviewed (at least those who are local) have seen these projects. Is it not as reasonable to believe that negative ratings are based on the respondents' actual experience rather than postulate it is based on the opposition of Preservation of the Downeast Lakes Watershed (PPDLW) opposition?
11. In table 3 on page 12 it is clear that the Bowers results for likelihood of returning if the respondent saw wind turbines is unexpectedly high compared to the other wind surveys. Why did you not look into why this anomalous response might have occurred? Could you also address the questions posed above in the Bowers User Survey issue eleven?
12. On page 14 it states that: "the collective results of the two studies indicate that the wind farm has not adversely impacted recreational use nor has it caused users of Baskahegan Lake to shift their recreation to other lakes without views of wind turbines." How do these surveys indicate this? There is no substantial information about user experience prior to construction of the Stetson Wind Project, so there can be no conclusions about the change cause by the project. In addition, both surveys only approached users of the lakes—there is no information about people who have changed their behavior because of the construction of the Stetson Wind Project. If this was an important issue, it would have been useful to ask respondents to the Bowers user survey if they have recreated on Baskahegan Lake in the past and if the construction of the Stetson Wind Project

effected their enjoyment or continued use. Junior, Pleasant and Scraggly Lakes are all possible places that disaffected users of Baskahegan Lake might have begun to use as an alternative.

13. On pages 13 and 16 the issue of “publicity bias concern” is presented. I remain unconvinced that statements by third parties are overpowering people’s actual experience with wind projects in the area, though I agree that it may cause them to think about it more. However, if this is a real issue, how would you balance the “publicity bias” from PPDW, an underfunded volunteer group of citizens, against the paid staff of First Wind and their consultants? Does First Wind not make a concerted effort to contact all potentially affected land owners personally? Are some of these land owners offered financial compensation for impacts to their property? Would this not create a positive bias in the pool of effected users?
14. On page 17 it states that: “as compared to the intercept surveys, there is no way to identify if the person answering an internet survey is actually a user of Junior Lake, Pleasant Lake, Scraggly Lake or Shaw Lake or just stated they were a user. Intercept surveys on-site allow confirmation that those interviewed are actually users.” I agree to this statement. Do you have a reason why it should not apply equally to the Bowers telephone survey that was conducted in 2011? Would you not agree that it seems that the “PPDW membership, those who own property on the lakes, owners of sporting camps on the lakes, and Licensed Guides who work the area” are more likely to be users, even frequent users of the four lakes than a panel of self-identified outdoor enthusiast drawn from New England states?

# memo

To: Jessica Damon

From: James F. Palmer

Date: 12 April 2013

RE: Michael Lawrence & Associates' Bowers Wind Project Critique of Project Developer's VIA

## Introduction

I have read the *Bowers Wind Project Critique of Project Developer's VIA*, prepared by Michael Lawrence & Associates (MLA). This memo presents my review comments of this document.

My overall impression is that MLA has based their critique primarily on an emotional appeal and eye-catching photography. There is very little objective data or analysis presented in this report, and no information about the methods used when objective data are presented (e.g., the visibility maps). That said, the approach taken is less about presenting a second analysis than restating criteria or data from the *Visual Impact Assessment for the Proposed Bowers Wind Project* and challenging whether they support the conclusions reached by LandWorks.

## Specific Comments

Following are my specific comments, referenced to the page to which they refer.

p. 4 Fact 1 is true--there will be visibility of some turbines from nine SRSNS lakes.

Fact 2 is true—for instance, Junior Lake is connected to West Grand Lake which stretches 18 miles from the project. However the relevance of this “fact” is unclear, given the Wind Energy Act's (WEA) does not give special status to linked SRSNS and it does give direction that “the primary siting authority shall consider insignificant the effects of portions of the development's generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance.”

p. 5 Fact 3 is true, but its relevance is unclear, given that the trust lands are not SRSNS and there is no attempt to claim this status for them.

Fact 4 is true—ridgelines are critical to landscape aesthetics, and they are particularly visible from open lakes. People are particularly sensitive to vertical objects that rise above the horizon

line and are “backdropped” by the sky. This “fact” needs to be linked as an indicator for one of the WEA Evaluation Criterion to be relevant.<sup>1</sup>

Fact 5 is unsupported—the term “wilderness sanctuary” is undefined, it is unknown whether people come to this area for this purpose or simply for an opportunity to be surrounded by a largely natural-appearing landscape, and no data are presented about the number of people who come primarily for this reason. Wilderness has a technical meaning that is not satisfied by a forest managed for timber and crisscrossed by logging roads that characterizes this area. Even as a more emotive term, it is difficult to understand how someone can claim they are seeking a “wilderness sanctuary” if they drive to a lodge or camp with electricity, a bed in a room with climate control, use a cell phone, and traverse the lake in a motor boat. What must someone leave behind to experience a “wilderness sanctuary” and are people willing to make this sacrifice? MLA does not even attempt to engage such issues.

- p. 6 I will address each of the five points made: (1) LandWorks does indicate that the SRSNS lakes are not unique, and possibly by implication attempts to diminish their value. (2) LandWorks correctly follows the WEA direction to ignore areas beyond 8 miles from the generating facilities. (3) LandWorks asserts that logging degrades scenic value, and therefore lessens the degradation caused by the Bowers Wind project. In general, the visual presence of logging operations does degrade scenic value—there are literally hundreds of research articles supporting this. (4) I would agree that LandWorks does not seem to recognize that ridgelines are visually sensitive, and goes so far as to say that they have the capacity to visually absorb the wind turbines. (5) MLA has not supported the assertion that the area has wilderness character LandWorks does indicate that the focus of some activities (e.g. fishing) is generally on the foreground and not distant views, though they do not support their assertion either.
- p. 7 While the lakes are flat, I disagree that the ridges surrounding the nine SRSNS lakes are “steeply rising mountains,” are “unique focal points” or offer “a distinct memorable profile.” I believe that MLA’s photographs adequately demonstrate that the ridgelines are generally rolling without a distinctive profile or sufficient elevation to be seriously considered mountains in a state with many ridges and peaks above 2,7000 feet (LURP’s cutoff for the Mountain Resources Subdistrict). On page 14 MLA states that “these ridgeline elevations are moderate.”
- p. 8 MLA asserts that the “nine SRSNS lakes rated ‘significant’ or ‘outstanding’ ... due to the types of physical features, including prominent distinctions in landforms, that are present and visible.” The *Scenic Lakes Evaluation for the Unorganized Towns in Maine* is the foundation evaluation study for the *Maine Wildlands Lake Assessment*. In this study, “prominent distinctions in landforms” are evaluated under the relief criterion, and all nine of the lakes were rated “low”. MLA’s assertion is unsupported.
- p. 9 MLA asserts that “movement attracts attention, particularly in a quiet landscape.” I can agree with this, but suggest that the photo on this page suggests that the lakes are in constant motion,

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<sup>1</sup> 35-A MRSA, § 3452, sub-§3

which is likely one of the reasons people seem to find lakes so attractive. It is true that half a turbine blade (28 meters or 92 feet) rising through and above a forested ridgeline would be visible past 3 miles if viewing conditions were favorable and one were looking for it, however, it would not be visually dominant. I think that it is unlikely to “draw the eye” to a significant degree.

MLA implies that LandWorks only investigated the visibility of the turbine hubs—LandWork’s Exhibit 1 is a viewshed map of turbine tips over bare terrain, Exhibit 3 is a viewshed map of turbine tips with screening of forest land cover set at a height of 40 feet.

- p. 10 MLA states that “photosimulations are a gross and imprecise representation of what will be visible to the naked eye if the project is constructed. Photosims mainly convey how a project will relate in scale and form to the existing landscape.” Photosimulations are simulations, representing only visual information for a selected visual arc. Evaluations based on photosimulations may vary depending on the selected viewpoint, the accuracy with which the changes are represented, and various technical details such as resolution and color fidelity. As simulations, some things are left out, such as the movement of the blades in the case of the Bowers Wind photosimulations. However, MLA does not provide any evidence for his assertion that “photosimulations are a gross and imprecise representation” only useful to “convey...project...scale and form.”

Overall, researchers have repeatedly found photographs to be useful and generally accurate representations for use in landscape perceptions studies (Palmer and Hoffman 2001, Stamps 2010). Palmer (1997) conducted one of the very few pre- and post-construction evaluations of a wind project. There respondents were randomly identified in the host and adjacent towns participated in both surveys. These respondents viewed half-tone (i.e., black and white laser printed) simulations printed on letter paper. In the post-construction survey, they were asked: “How accurate do you think these simulations are when compared to the actual project? (We suggest that you take the time to compare the simulations to the actual views.)” As shown in the table below, the results indicate that even these half-tone simulations were thought to be very accurate, even by people who went out and actually checked them against the constructed project.

**Accuracy of the visual simulations when compared to the actual project.**

Rating	Percent	Checked outside?	
		Yes	From memory
Very accurate	46.6	50.9	47.6
Somewhat accurate	40.3	39.6	41.1
Uncertain	8.5	1.9	7.1
Somewhat inaccurate	3.4	5.7	3.0
Very inaccurate	1.3	1.8	1.2
Number of responses	236	53	168

Notes: 24% checked accuracy in the field, the remainder responded from memory. There is no significant difference between these two groups ( $X^2 = 2.95$ ,  $p = 0.566$ ,  $df = 4$ ).

MLA presents no evidence to support his assertion. Rather than make unsupported claims, a more constructive approach would be to advocate that the validity of photosimulations for use in evaluating the scenic impacts of wind projects in Maine be monitored. This would be essentially the same as requiring monitoring for the effects of individual projects on wildlife or noise.

- p. 10 There are certainly times when an actual view will be more evocative than a simulation. However, I believe that LandWorks' point was that there are also times when conditions do not allow one to actually view a project, such as pre-construction or low visibility conditions. No one is claiming that simulations are other than they are—a reasonable representation. For the most part, the Bowers simulations are fair representations, though the Keg Lake simulation in particular is not up to professional standards. Raising the senses of “touch, sound, [and] smell” is not relevant, since none of the SRSNS are close enough to involve these senses. Movement may be important, though MLA presents no information to support this.
- p. 10-11 MLA is selectively misinterpreting what LandWorks intended when it wrote “Collectively, these different sources provide a more comprehensive understanding of the scenic resource to be evaluated and the potential effect the Project may have on users of those resources.” While MLA only references the “The Guide Services, Sporting Camps and Lodging, Guidebooks, and other website resources,” he ignores the resources that do concern the visual impact of wind projects. In particular, there has been a pattern of general consistency among the intercept surveys conducted for Maine wind projects, and the intercept survey conducted for the Bowers Wind Project follows this pattern.

A more responsible approach would have been to describe and carry out a thorough content analysis of descriptions relating the impacted area and its surroundings. In the brief analysis I conducted of the state tourist sites for my review of the LandWorks VIA (Palmer 2013), I found some references to Grand Lake Stream, but not to areas within the 8-mile area of potential effects determined by the WEA.

- p. 12 A photograph from Grand Lake Stream is outside the area of potential significant effects. Other photos from outside the affected area are found on pages 19, 43, 44, 48, and 54.

MLA is correct in stating that “the intrinsic value of the nine scenic lakes is not lessened by the lack of mention on these websites.” However, neither is it increased through MLA's unsupported assertions. What is needed is an evaluation procedure that identifies specific indicators for evaluation the criteria specified by the WEA, and thresholds for determining when Adverse impacts become Unreasonable. MLA has not provided such an analysis.

- p. 13 The statement by LandWorks is accurate, the map reproduced on page 13 of their VIA does not appear to extend within 8 miles of the project. MLA overstates the number of linked lakes—not all nine SRSNS lakes are linked by water.

The basis for identifying the Passamaquoddy Tribal Lands as “Conserved Lands” in the map is unclear. It is reported that the “Passamaquoddy Tribe of Indian Township and Pleasant Point has partnered with a Midwest energy firm to launch a \$120 million wind farm in Washington County” about 40 miles south of the Bowers Wind Project (Mack 2012)

- p. 14 I believe that LandWorks’ evaluation is accurate: “The relief as viewed from lakes in the area is not dramatic or unique.” I also agree with MLA that the “ridgeline elevations are moderate,” and based on my fieldwork and the photographs MLA presents disagree that the landforms have “distinctive profiles.”
- p. 15 MLA presents a sophist argument, yes people come to the SRSNS lakes to fish so they may be considered in some sense “tourist destinations.” However, he fails to present any data showing that the SRSNS within 8 miles of the project are “tourist destinations” for a significant number of people within the context of Maine tourism.
- p. 16 The photograph on this page masks the appearance of the visual impacts of logging by being taken in poor light conditions, printed at a low resolution, and perhaps being slightly out of focus. This is an example of how photographs can be misleading, as MLA asserts on pages 10 and 22. However, I would not dispute MLA’s main point, that while aerial photos may show the area is heavily harvested, and this impression may be supported when one is driving along the many dirt roads through the area, it is not the general impression one has from the SRSNS lakes. This is not to say that the effects of forest management are not visible, rather it is not visually dominant or create a sense of unreasonable scenic degradation from the SRSNS lakes.
- p. 17 I believe that LandWorks’ map on page 25 of their VIA showing the location of camps or houses near the SRSNS lakes provides useful data, which I appreciate. In particular, Bottle, Duck and portions of Junior and Sysladobsis Lakes are densely developed within the context of Maine Lakes. However, I also agree with MLA that these data demonstrate that “most of the Pleasant, Shaw, Scraggly, and Junior Lakes’ shorelines are undeveloped.” I also agree with MLA that my general impression when visiting the more developed areas of these lakes was that from the water structures were “sited comfortably and blended well among mature trees.” As I indicated in my review of LandWorks’ VIA, this is why the Maine Wildlands Lakes Assessment did not subtract points for Inharmonious Development on Bottle or any of the other lakes.
- p. 18 No information is given for this visibility map. What does it represent—turbine hubs or blade tips, only terrain or forest screening? In addition, it is practically invisible to a red-green color blind person.

While LandWorks does focus on the results of the visibility of turbine hubs as seen over a screen of 40-foot high forest vegetation, it did present the results of all the standard visibility analyses in Exhibits 1 through 4. These visibility maps overstate the visibility from the SRSNS lakes because the shoreline vegetation is generally higher than the 40 feet assumed in the analysis. However, increasing the height of the forest cover to 65 feet does not dramatically change visibility from the SRSNS lakes.

- p. 19 The WEA specifies what qualifies as a SRSNS, and its first Evaluation Criterion requires consideration of “the significance of the potentially affected SRSNS,” but it does not state what indicators and thresholds to use for this Criterion.

It is surprising that MLA argues that the “the Maine Wildlands Lake Assessment are the only legal indicator of significance,” since he is trying to persuade us that these 9 SRSNS lakes with visibility of the Bowers Wind Project are of the highest scenic character, wilderness really. Yet the Wildlands Lake Assessment only found Pleasant Lake to have Outstanding scenic value (while West Grand Lake also has Outstanding scenic value, the bay called Pug Lake is a very small and isolated area, perhaps not representative of the larger lake). Among the areas affected by wind energy projects in Maine, this is a relatively low proportion of Outstanding lakes.

As with all the WEA Evaluation Criteria, there needs to be more specific indicators that are valid and can be reliably measured (whether quantitatively or qualitatively), and thresholds need to be identified to determine when an impact is Adverse and Unreasonably Adverse. Palmer (2013, p. 16) proposed an indicator based on the ratings from the original two field studies of the scenic value of Maine’s lakes (Jones 1986, Parking and Lortie 1989). Only Pug Lake was among the highly significant lakes in the state, and as just indicated it is a small area and the only portion of the much larger West Grand Lake that is within 8 miles of the Bowers Wind Project.

- p. 20 I would agree with MLA that number of visitors, *per se*, is probably not a very good indicator for Criterion A (Significance). Palmer (2013, p. 16) proposed an indicator based on the visitor catchment area. This indicator has the advantage of already being part of Maine law.<sup>2</sup>

A scenic resource visited by large numbers who come from across the country or state is generally considered to have national or statewide significance. A scenic resource visited primarily by people of local origin is generally of local significance. Unvisited places either have no designated significance or are “no trespass” places.

By this criterion, the three lakes involved in the intercept survey (Junior, Pleasant and Scraggly Lakes) appear to be of primarily local significance.

If MLA believes that that high significance is a function of being “less frequently utilized,” then he should propose and justify an indicator and thresholds to support this view. I would note that the NRPA explicitly states that “unvisited places ... have no designated significance.”

- p. 21 MLA continues to repeat unsupported assertions. While the interconnected system of Junior, Bottle, Duck, Scraggly and Pug Lakes will have visual impacts from the project, the interconnected system of Junior Bay, West Grand, Pocumcus, and Sysladobsis Lakes is largely beyond 8 miles from the proposed turbines, the scenic impacts are insignificant.

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<sup>2</sup> Natural Resources Protection Act (NRPA) rule Chapter 315 §10. This rule also appears to have been the basis for the WEA definition of SRSNS.

- p. 22 LandWorks made their point and MLA accepts it; one does not need to resort to a critique of photographic quality to explain why the 5,269 foot Mount Katahdin towering over the tree line is a distinctive landmark, and the 1,100-foot Bowers Ridgeline visible slightly above the tree line is not. LandWorks' point is that the landforms in this area are not landmarks of statewide significance, such as Mount Katahdin or the Bigelow Range.
- p. 24 The Federal Highway Administration (FHWA) VIA approach asserts that visual quality is a function of vividness, intactness and unity (US DOT 1981). (Intactness and unity are independent and separate attributes, not synonyms as implied by LandWorks.) The US Forest Service, Bureau of Land Management, and US Army Corps of Engineers use various alternative approaches. There is little empirical evidence supporting any of these approaches (Churchward et al. 2013). Neither LandWorks nor MLA proposes a method to apply these indicators with thresholds that allow us to determine the level of scenic value significance.

I would agree that generally the lake views have high Intactness (visual integrity, free of encroaching elements) and Unity (visual coherence, harmony, whole). Views from some roads (which are not SRSNS) have less Intactness and Unity due to highly visible forest management activity and residential development. I do not believe that these views exhibit high Vividness (memorable, distinctive) in the context of Maine. This is the point made by LandWorks and apparently accepted by MLA on page 22 (see preceding comment).

I believe that Vividness (memorable, distinctive) will increase with the presence of the Bowers Wind project; the turbines will add a memorable and distinctive element. There appears to be some disagreement about how the turbines "fit" into a natural landscape. As a result, some see degradation on Intactness—turbines are an encroaching industrial element; others see a symbol of human efforts to control climate change that they find very compatible. Similarly, some see a degradation of Unity—turbines are a source of disharmony in an otherwise natural-appearing landscape; others see a modern technology that has an overall positive impact on the environment compared to the alternatives.

I do not support the use of Vividness, Intactness and Unity to determine Criterion A, the significance of a SRSNS because the terms are difficult to apply reliably, and their ratings have not been shown to be reliable measures of scenic value or impact.

- p. 25 I agree with MLA that argument of bias cuts both ways—angry residents can see no good, and wind developers can see no bad. The WEA directs that the effect to the public using SRSNS be considered, not residents or wind developers, except when they are users of SRSNS. The intercept surveys make an attempt to obtain a random (i.e., unbiased) sample of users of specific SRSNSs that will have visibility of a specific proposed wind development. The overwhelming benefit of intercept surveys is this targeting of the relevant population in an unbiased way.
- p. 26 MLA misses the point LandWorks is trying to make. The *Maine Wildlands Lake Assessment* does identify SRSNS based on intrinsic attributes thought to represent scenic value. However, WEA

Criteria C (the expectations of the typical viewer) and E.2 (potential effect of the generating facilities' presence on the public's continued use and enjoyment of the SRSNS) are very much effected by "how different user groups comprehend those innate values."

- p. 27 LandWorks does not give a citation for the "field study has led to a conclusion that once a paddler takes in a wind energy project and acknowledges its presence, other elements and views do draw the eye, and the prominence or presence of the turbines diminish in a focus." I am unaware of any systematic published research with this finding.

I am in general agreement with MLA's statement—"paddlers are moving slowly," the turbines will be visible from "many places on the nine SRSNS lakes," and "the towers will be visually and virtually unavoidable." However, the WEA makes it clear that "a finding... that the development's generating facilities are a highly visible feature in the landscape is not a solely sufficient basis for determination that an expedited wind energy project has an unreasonable adverse effect on the scenic character and existing uses related to scenic character of a SRSNS."

In the case of paddlers, the WEA Evaluation Criteria direct consideration of how the presence the proposed wind turbines effect their enjoyment and continued use of the SRSNS, and how they relate to their expectations. Palmer's (2013) analysis of the intercept survey results indicated that there would be a medium effect on enjoyment and continued use on Junior Lake. On Pleasant and Scraggly Lakes, the effect on enjoyment would be low, and on continued use it would be medium. These results based on the response of actual users of the three largest and most visually impacted SRSNS who were shown accurate photosimulations of "worst case" views from the lake they were using.

- p. 28 LandWorks paints a verbal portrait of camp activity that minimizes the role of scenic value and views to the distance. In contrast, MLA asserts that the "sensory experience...will be ruined." Neither presents any data to support their position.

However, it is clear that based on the WEA definition, the primitive campsites discussed here are not part of the SRSNS. (i.e., the SRSNS lake boundary ends at the water's edge).

- p. 29 MLA states that people "travel to the nine scenic lakes to satisfy a need for quiet, sense of wilderness and a place with a minimal presence of urbanization." If one takes this assertion literally, then it appears false. Clearly at the distances being considered here, the "need for quiet" will not be altered, turbine noise at three miles distance will not be audible. The area is not a wilderness now—there are roads throughout the area, and residences on many of the lakes. While the turbines are very large and mechanical, they are less signs of urbanization than the existing roads and residences. Further, the WEA states that "determination that a wind energy development fits harmoniously into the existing natural environment in terms of potential effects on scenic character and existing uses related to scenic character is not required."

MLA asserts that because of the visual change, “a significant number of people will” ... “choose another lake.” No evidence is presented for this assertion and no estimate of how many people “a significant number.”

However, MLA may not intend his words to be taken literally, but as hyperbole—an obvious and intentional exaggeration made for rhetorical purposes. If this is the case, it undermines his critique, which would be better served by more accurate and precise language describing how the WEA Evaluation Criteria should be considered and how the results of such a consideration would lead to the conclusion that the scenic impacts are Unreasonably Adverse. In particular, rather than simply making unsupported assertions, MLA’s critique would benefit by identifying clearly defined and reliably measurable indicators for each WEA Evaluation Criteria, justifying thresholds for determining when the scenic impact becomes Unreasonable, and then presenting the appropriate data. He does not do this.

- p. 31 MLA presents useful graphics on pages 31 and 32 to help us understand the relative size of the Bowers Wind Project’s turbines to the elevation of the ridge above the lakes. It would be useful if he stated which lake and which turbines were being used for these graphics, so that others could check his work.

MLA is also correct that the US Forest Service’s (1995) *Handbook on Scenery Management* does not address wind energy development. Nor was it covered in the *National Forest Landscape Management, Volume 2, Chapter 2, Utilities* (1975).

- p. 34 When reading the US Forest Service’s (1995) *Handbook on Scenery Management* it is important to remember that it applies to National Forests, not private lands which have very different management objectives.

When the USFS refers to wilderness, they mean a large designated area without roads, where motorized vehicles or boats, permanent structures, and logging is not allowed. MLA wants to evoke the aura of “wilderness” but ignores the defining attributes. An appropriate approach is to identify the indicators that are of concern and justify their contribution to the consideration under one of the WEA Evaluation Criteria. For instance, “remoteness” might be a relevant indicator for Criterion B (character of the surrounding area). For instance Palmer (2013) employed thresholds used in Maine to map the “remoteness” of the area within 8 miles of the Bowers Wind Project turbines.

- p. 37 MLA simply asserts that the nine SRSNS lakes meet the “primary area” thresholds, but no data are presented to support this assertion. The US Forest Service’s (1995) *Handbook on Scenery Management* describes Primary Use Areas as “national and/or regionally important locations largely associated with recreation and tourism use,” while Secondary Use Areas are “locally important locations associated with all types of use including recreation and tourism.” In all cases, when viewed in the context of the Downeast or Maine Highlands tourist regions, Palmer (2013) found that the nine SRSNS lakes within 8 miles of the Bowers Wind turbines appeared to

be Secondary Use Areas. This also seems to be the reasonable conclusion based on user counts observed by Stantec and Kleinschmidt, and the ZIP codes of respondents to the intercept survey.

- p. 37 I do not understand why MLA's criticism. LandWorks assessed visibility based on "both topographic and vegetative screening" and they considered visibility of both the turbine hub and an upright blade tip. LandWorks generally chose photosimulation viewpoints that had high visibility for the represented SRSNS, but did not always use photographs that represented viewing conditions for optimal contrast between the turbines and their surroundings. However, it is common professional practice that some photographs may be less than optimal, and the expectation has been that a good faith effort has been made to represent the "worst case" conditions.
- p. 39 I agree with MLA that visual absorption capacity is inappropriately applied for a ridgeline wind project.
- p. 40 I agree with MLA that the proposed wind turbines are very high relative to the height of the ridges on which they are constructed. However, MLA does not present any support for the assertion that they are awkward (I have heard people refer to them as "graceful"). I agree with MLA that moving turbine blades will attract the viewer's attention, especially when most of their circular sweep is visible. But MLA provides no data to support the contention that the turbines will be viewed as "incongruous" or in other ways be offensive.
- I accept that some people will find them offensive. However, MLA needs to ground this assertion in the WEA Evaluation Criteria, and present data to support his assertion.
- p. 41 I agree with MLA that it is unclear how "turbines spaced in a linear fashion at regular intervals" creates visual landscape coherence. However, neither MLA nor LandWorks presents any data supporting their assertions about how the arrangement of turbines affects visual coherence.
- p. 43 I agree with MLA that it would be helpful if the basic metrics for important views were reported to help develop a comparative understanding of different views and projects.
- P. 44 MLA asserts that "tourists from Grand Lake Stream boat to all the lakes in the Downeast Lakes Watershed." How many of these tourists boat to all the lakes? The boat counts that have been entered into the record suggest that few people are passing from West Grand Lake to Junior Lake, the primary entry from Grand Lake Stream. The number of users observed during the intercept survey was also modest. MLA needs to present reliably systematically collected data to support his assertion.
- p. 45 The WEA directs that the scenic impacts to Grand Lake Stream are insignificant, because it is beyond 8 miles from the Bowers Wind Project.
- p. 46-47 It is a good sign that MLA recognizes the value of the intercept survey results. It would be more helpful if he used these results to create indicators for the WEA Evaluation Criteria, and

identified appropriate thresholds for determining when the scenic impacts were Unreasonable and not simply adverse.

- p. 48 MLA uses the intercept survey to indicate that there are some who believe that the Bowers Wind Project will have an Adverse scenic impact—but the WEA anticipates this response. MLA fails to identify thresholds or a procedure for determining when an Adverse scenic impact becomes Unreasonable.
- p. 49 It is misleading for MLA to refer to the nine SRSNS lakes as a “networked system”—they are not all linked together.
- p. 49 The *Wildlands Lakes Assessment* was conducted using clearly defined criteria, indicators and thresholds to evaluate all the great ponds in the unorganized territory. It is inappropriate to return to a few lakes and argue that they qualify for “higher scores than they received.” This is particularly true, since MLA provides no systematically collected data to support his assertion.

It has been my experience that occasionally I will disagree with a rating from the *Wildlands Lakes Assessment* but overall it was a well conducted study and represents a planning resource rarely found in the United States.

- p. 50 MLA moves from 50 pages of asserting that the area is wilderness to now asserting that it is “wilderness-like with a remote feel.” He fails to identify the methods and data that support either assertion (i.e., that it is wilderness or wilderness-like).

Contrary to MLA’s assertion that the conservation easements in this area are to “protect that wilderness character,” it is my understanding that the easements are to assure that the area will remain a working forest.

While I agree with MLA that the SRSNS lakes are “not crowded,” I disagree that this also means they have a “sense of remoteness.” No data are presented to support this.

MLA properly identifies that the intercept survey found the project may have a serious impact on continued use of the three SRSNS lakes in the survey. However, no rationale for determining whether the threshold for the impact being Unreasonably Adverse is presented.

Again, MLA identifies that the project is likely visible from a large proportion of nine SRSNS lakes, but the WEA explicitly states that visibility itself is insufficient. MLA fails to tie this to an Evaluation Criterion and present it as an indicator with a threshold for determining if the impact is Unreasonable.

- p. 52 I agree with MLA that Crystal Lake is not comparable to the landscape character found within 8 miles of the Bowers Wind Project.
- p. 54 I fail to see the evidence that supports some of MLA’s conclusion. I do not believe that the area has “wilderness character” or that the introduction of wind turbines crates a “sense of urban

presence.” The topographic relief is not “dramatic and unique;” on page 14 MLA recognizes that the “ridgeline elevations are moderate.” It takes more than someone visiting an area in the 1800s for it to be considered a “tourist destination” of significance today. Logging operations are antithetical to wilderness.

I agree that there are nine SRSNS lakes with potential visibility of the Bowers Wind Project, and that “visual absorption capacity is irrelevant.”

- p. 57 SMLA seems to have the beginnings of a procedure to select photographic simulation viewpoints. It would be helpful if he would define what he means by “worst case” and describe why his procedure identifies these locations. In particular I question whether the top tip of a blade is really the best indicator of “worst case” visibility, I tend to agree with LandWorks that the place with greatest visibility of hubs may be a better indicator, since one could easily oversee just a tip. I am also not clear why “photosims need to be assembled at ½ mile intervals.” A regular sampling scheme will not necessarily give the “worst case” viewpoints, though it does give a way to calculate the average impact to the lake. I am unclear why MLA sometimes deviates from this sampling scheme in the figure. It is uncertain whether a random sample of users at SRSNS would be willing to evaluate so many existing and future simulations.
- p. 57 “Those judging the project would be well served to travel to the photos’ original lake locations and compare the photosimulations with reality.” On December 13, Jim Beyer (DEP), Jessica Damon (DEP) and James Palmer (DEP’s scenic expert) visited the Baskahegan boat launch and compared photographs of the Stetson Wind Project to the actual view of the project. They also viewed the photosimulations near their viewpoint on Junior, Pleasant, Scraggly and Shaw Lakes. Bottle Lake was also visited.
- p. 58
1. Yes, nine SRSNS lakes will have some visibility of the Bowers Wind turbines
  2. No, all of these nine SRSNS lakes are not part of a larger chain of lakes.
  3. No, as MLA’s map on page 13 shows, the 9 SRSNS lakes are not all surrounded by conservation lands. No documentation is presented to demonstrate that wind energy development is incompatible with the Sunrise Conservation Easement, West Grand Lake Forest or Passamaquoddy Tribal Lands.
  4. Yes, ridgelines are critical to landscape aesthetics, and they are susceptible to visual impacts. However, the WEA anticipates this: “the Legislature recognizes that wind turbines are potentially a highly visible feature of the landscape that will have an impact on views.” As a result the legislature specified a series of more specific Evaluation Criteria to evaluate wind energy scenic impacts.
  5. No, it is very unlikely that all visitors to the area “come here seeking wilderness sanctuary.” While it is easily recognized that no one would come here for an urban experience, it should be similarly obvious that people do not come to have a “wilderness experience” if they stay in a

lodge, drive in their car, use a motor boat, etc. A clear definition of what MLA means by “wilderness” is not presented; nor is evidence given about how many people come to the area to experience whatever condition he is trying to describe.

### Conclusions

It is my sense that MLA is deeply concerned about preserving the scenic character of the area within 8 miles of the Bowers Wind Project. He has presented a selection of photographs that highlight the scenic qualities he so highly values, and he has prepared a critique that uses evocative and picturesque language to emphasize his concerns. However, he has been unable to link his presentation to the WEA Evaluation Criteria, which must form the basis of DEP’s findings and decision.

MLA does not present a fundamental challenge to the procedures or analysis presented by LandWorks in their VIA—identification of SRSNS, visibility maps, simulations. It is the interpretation of what this analysis means that is being challenged. MLA appears to simply assert that visible wind turbines cause scenic degradation. However, the WEA is clear that an analysis must include more than simple visibility and the assertion that it is unreasonable. Other than photographs, MLA presents little to no data and no real analysis. There is no attempt to describe a reliable procedure to implement the WEA Evaluation Criteria, which must form the basis of DEP’s findings and decision.

### References

- Churchward, Craig, James F. Palmer, Joan Iverson Nassauer, and Carys Anne Swanwick. 2013. *Evaluation of Methodologies for Visual Impact Assessments*. Washington, DC: Transportation Research Board. 149 p.
- Jones, Judy J. 1986. *Scenic Lakes Evaluation for the Unorganized Towns in Maine*. Augusta, ME: Maine Department of Conservation and Maine State Planning Office.
- LandWorks. 2012. *Visual Impact Assessment for the Proposed Bowers Wind Project*. Middlebury, VT: LandWorks. 129 pp. plus maps, photo inventory, and visual simulations.
- Mack, Sharon K. 2012. Passamaquoddy Tribe plans \$120M wind farm in Washington County. Bangor Daily News, January 26, 2012. (Accessed April 11, 2013) <http://bangordailynews.com/2012/01/26/business/passamaquoddy-tribe-plans-120m-wind-farm-in-washington-county/>
- Palmer, James F. 2013. *Review of the Bowers Wind Project Visual Impact Assessment, Part 2: Independent Analysis*. 54 p.
- Palmer, James F. and Robin E. Hoffman. 2001. Rating reliability and representation validity in scenic landscape assessments. *Landscape and Urban Planning*, 54(1-4): 149-161.

Palmer, James F. 1997. *Public Acceptance Study of the Searsburg Wind Power Project: Year One Post-construction*. South Burlington, VT: Green Mountain Power Corp. 57 p. + appendices.

Parkin, Drew, and John Lortie. 1989. *Scenic Lakes Evaluation for the Organized Towns in Maine*. Augusta, ME: Maine Critical Areas Program, State Planning Office.

Stamps III, Arthur E. 2010. Use of static and dynamic media to simulate environments: A meta-analysis. *Perception and Motor Skills*, 111(2):355-364.

U.S. Department of Transportation. 1981. *Visual Impact Assessment for Highway Projects*. Washington, DC: U.S. DOT, Federal Highway Administration, Office of Environmental Policy.