

Appendix

Transcriptions of bearded seal calls

All the musical materials in Under the Sea Ice derive from transcriptions of underwater songs of bearded seals in the Chukchi Sea, in the Arctic Ocean.

Audios of each of the transcriptions in this appendix are included with the track for the electronics of the piece.

Prior to rehearsal, please take a few moments to play these audio while looking at the corresponding transcriptions. Listening to the source materials and embodying them are the essence of this work.

AL1i2 Ray

Christopher Luna-Mega (2015)

p *<mf>* *<mf>* *p*

5


f *f* *f* *f* *f* *f* *f*

10

f *p* *f* *p* *mf* *p*


15

f *ff* *mp*

20 

[illegible]

30

[illegible]

40 *loco*

Measures 40-42 of the piece. Measure 40 starts with a treble clef and a key signature of one sharp (F#). The melody begins on G4, moves to A4, and then to B4. Measure 41 continues with B4, then A4, G4, and F#4. Measure 42 starts with a double bar line, followed by G4, A4, B4, and a final G4. The notation includes slurs and ties across measures.

45

[illegible][illegible]

AL1i2

8^{va}

0 *mp* *mf* *f*

5

10 *mf*

15

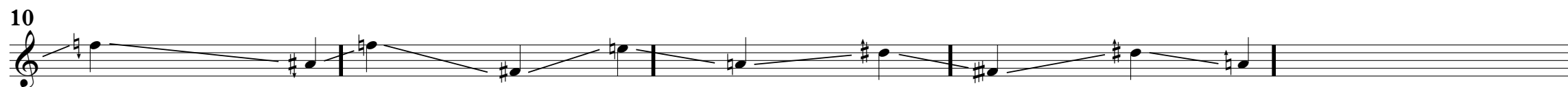
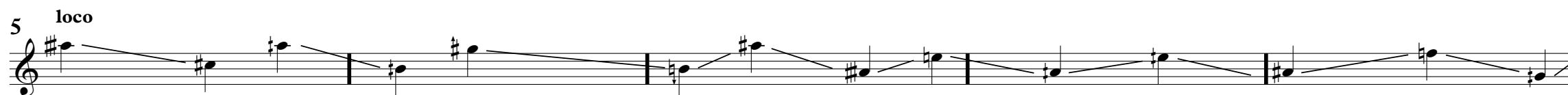
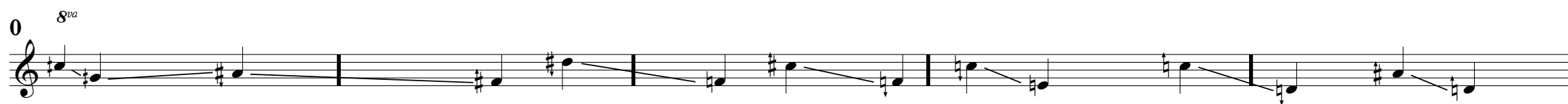
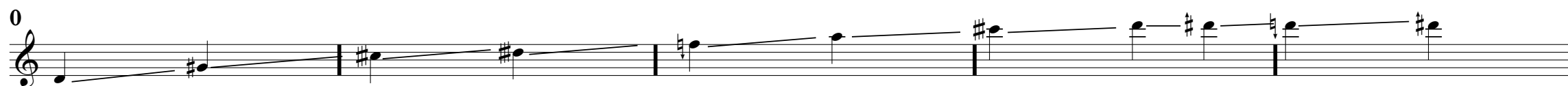
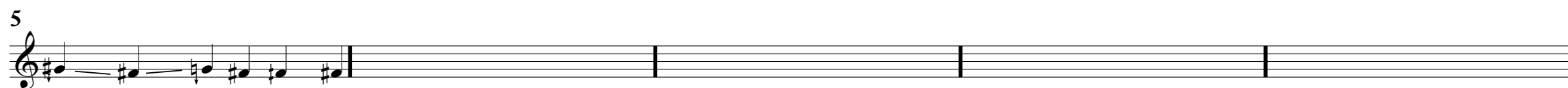
20

25 loco

30

35

This musical score is for a piece titled 'AL1i2'. It is written for a single melodic line in treble clef. The key signature has one sharp (F#), and the time signature is 4/4. The score is divided into measures, with measure numbers 0, 5, 10, 15, 20, 25, 30, and 35 marked at the beginning of their respective staves. The notation includes various note values (quarter, eighth, and sixteenth notes), rests, and accidentals (sharps and naturals). Dynamic markings are present: 'mp' (mezzo-piano) at measure 0, 'mf' (mezzo-forte) at measures 5 and 10, and 'f' (forte) at measure 20. A 'loco' marking is placed above measure 25. The score features several slurs and ties, indicating phrasing and sustained notes. The first staff (measures 0-4) includes a '8^{va}' marking above the staff, suggesting an octave transposition. The piece concludes at measure 35.

AL5**AL7****AL4**

5

8^{va}

5 *f* (gliss to every note) (gliss simil)

The musical notation shows a sequence of notes on a five-line staff. The first note is a G4 (first line). The second note is an A4 (first space). The third note is a B4 (second line). The fourth note is a C5 (second space). The fifth note is a D5 (third line). The sixth note is an E5 (third space). The seventh note is a F5 (fourth line). The eighth note is a G5 (fourth space). The ninth note is an A5 (fifth line). The tenth note is a B5 (first line of the next octave). The eleventh note is a C6 (first space of the next octave). The twelfth note is a D6 (second line of the next octave). The thirteenth note is an E6 (second space of the next octave). The fourteenth note is a F6 (third line of the next octave). The fifteenth note is a G6 (third space of the next octave). The sixteenth note is an A6 (fourth line of the next octave). The seventeenth note is a B6 (fourth space of the next octave). The eighteenth note is a C7 (fifth line of the next octave). The nineteenth note is a D7 (first line of the next octave). The twentieth note is an E7 (first space of the next octave). The twenty-first note is a F7 (second line of the next octave). The twenty-second note is a G7 (second space of the next octave). The twenty-third note is an A7 (third line of the next octave). The twenty-fourth note is a B7 (third space of the next octave). The twenty-fifth note is a C8 (fourth line of the next octave). The twenty-sixth note is a D8 (fourth space of the next octave). The twenty-seventh note is an E8 (fifth line of the next octave). The twenty-eighth note is a F8 (first line of the next octave). The twenty-ninth note is a G8 (first space of the next octave). The thirtieth note is an A8 (second line of the next octave). The thirty-first note is a B8 (second space of the next octave). The thirty-second note is a C9 (third line of the next octave). The thirty-third note is a D9 (third space of the next octave). The thirty-fourth note is an E9 (fourth line of the next octave). The thirty-fifth note is a F9 (fourth space of the next octave). The thirty-sixth note is a G9 (fifth line of the next octave). The thirty-seventh note is an A9 (first line of the next octave). The thirty-eighth note is a B9 (first space of the next octave). The thirty-ninth note is a C10 (second line of the next octave). The fortieth note is a D10 (second space of the next octave). The forty-first note is an E10 (third line of the next octave). The forty-second note is a F10 (third space of the next octave). The forty-third note is a G10 (fourth line of the next octave). The forty-fourth note is an A10 (fourth space of the next octave). The forty-fifth note is a B10 (fifth line of the next octave). The forty-sixth note is a C11 (first line of the next octave). The forty-seventh note is a D11 (first space of the next octave). The forty-eighth note is an E11 (second line of the next octave). The forty-ninth note is a F11 (second space of the next octave). The fiftieth note is a G11 (third line of the next octave). The fifty-first note is an A11 (third space of the next octave). The fifty-second note is a B11 (fourth line of the next octave). The fifty-third note is a C12 (fourth space of the next octave). The fifty-fourth note is a D12 (fifth line of the next octave). The fifty-fifth note is an E12 (first line of the next octave). The fifty-sixth note is a F12 (first space of the next octave). The fifty-seventh note is a G12 (second line of the next octave). The fifty-eighth note is an A12 (second space of the next octave). The fifty-ninth note is a B12 (third line of the next octave). The sixtieth note is a C13 (third space of the next octave). The sixty-first note is a D13 (fourth line of the next octave). The sixty-second note is an E13 (fourth space of the next octave). The sixty-third note is a F13 (fifth line of the next octave). The sixty-fourth note is a G13 (first line of the next octave). The sixty-fifth note is an A13 (first space of the next octave). The sixty-sixth note is a B13 (second line of the next octave). The sixty-seventh note is a C14 (second space of the next octave). The sixty-eighth note is a D14 (third line of the next octave). The sixty-ninth note is an E14 (third space of the next octave). The seventieth note is a F14 (fourth line of the next octave). The seventy-first note is a G14 (fourth space of the next octave). The seventy-second note is an A14 (fifth line of the next octave). The seventy-third note is a B14 (first line of the next octave). The seventy-fourth note is a C15 (first space of the next octave). The seventy-fifth note is a D15 (second line of the next octave). The seventy-sixth note is an E15 (second space of the next octave). The seventy-seventh note is a F15 (third line of the next octave). The seventy-eighth note is a G15 (third space of the next octave). The seventy-ninth note is an A15 (fourth line of the next octave). The eightieth note is a B15 (fourth space of the next octave). The eighty-first note is a C16 (fifth line of the next octave). The eighty-second note is a D16 (first line of the next octave). The eighty-third note is an E16 (first space of the next octave). The eighty-fourth note is a F16 (second line of the next octave). The eighty-fifth note is a G16 (second space of the next octave). The eighty-sixth note is an A16 (third line of the next octave). The eighty-seventh note is a B16 (third space of the next octave). The eighty-eighth note is a C17 (fourth line of the next octave). The eighty-ninth note is a D17 (fourth space of the next octave). The ninetieth note is an E17 (fifth line of the next octave). The hundredth note is a F17 (first line of the next octave). The hundred and first note is a G17 (first space of the next octave). The hundred and second note is an A17 (second line of the next octave). The hundred and third note is a B17 (second space of the next octave). The hundred and fourth note is a C18 (third line of the next octave). The hundred and fifth note is a D18 (third space of the next octave). The hundred and sixth note is an E18 (fourth line of the next octave). The hundred and seventh note is a F18 (fourth space of the next octave). The hundred and eighth note is a G18 (fifth line of the next octave). The hundred and ninth note is an A18 (first line of the next octave). The hundred and tenth note is a B18 (first space of the next octave). The hundred and eleventh note is a C19 (second line of the next octave). The hundred and twelfth note is a D19 (second space of the next octave). The hundred and thirteenth note is an E19 (third line of the next octave). The hundred and fourteenth note is a F19 (third space of the next octave). The hundred and fifteenth note is a G19 (fourth line of the next octave). The hundred and sixteenth note is an A19 (fourth space of the next octave). The hundred and seventeenth note is a B19 (fifth line of the next octave). The hundred and eighteenth note is a C20 (first line of the next octave). The hundred and nineteenth note is a D20 (first space of the next octave). The hundred and twentieth note is an E20 (second line of the next octave). The hundred and twenty-first note is a F20 (second space of the next octave). The hundred and twenty-second note is a G20 (third line of the next octave). The hundred and twenty-third note is an A20 (third space of the next octave). The hundred and twenty-fourth note is a B20 (fourth line of the next octave). The hundred and twenty-fifth note is a C21 (fourth space of the next octave). The hundred and twenty-sixth note is a D21 (fifth line of the next octave). The hundred and twenty-seventh note is an E21 (first line of the next octave). The hundred and twenty-eighth note is a F21 (first space of the next octave). The hundred and twenty-ninth note is a G21 (second line of the next octave). The hundred and thirtieth note is an A21 (second space of the next octave). The hundred and thirty-first note is a B21 (third line of the next octave). The hundred and thirty-second note is a C22 (third space of the next octave). The hundred and thirty-third note is a D22 (fourth line of the next octave). The hundred and thirty-fourth note is an E22 (fourth space of the next octave). The hundred and thirty-fifth note is a F22 (fifth line of the next octave). The hundred and thirty-sixth note is a G22 (first line of the next octave). The hundred and thirty-seventh note is an A22 (first space of the next octave). The hundred and thirty-eighth note is a B22 (second line of the next octave). The hundred and thirty-ninth note is a C23 (second space of the next octave). The hundred and fortieth note is a D23 (third line of the next octave). The hundred and forty-first note is an E23 (third space of the next octave). The hundred and forty-second note is a F23 (fourth line of the next octave). The hundred and forty-third note is a G23 (fourth space of the next octave). The hundred and forty-fourth note is an A23 (fifth line of the next octave). The hundred and forty-fifth note is a B23 (first line of the next octave). The hundred and forty-sixth note is a C24 (first space of the next octave). The hundred and forty-seventh note is a D24 (second line of the next octave). The hundred and forty-eighth note is an E24 (second space of the next octave). The hundred and forty-ninth note is a F24 (third line of the next octave). The hundred and fiftieth note is a G24 (third space of the next octave). The hundred and fifty-first note is an A24 (fourth line of the next octave). The hundred and fifty-second note is a B24 (fourth space of the next octave). The hundred and fifty-third note is a C25 (fifth line of the next octave). The hundred and fifty-fourth note is a D25 (first line of the next octave). The hundred and fifty-fifth note is an E25 (first space of the next octave). The hundred and fifty-sixth note is a F25 (second line of the next octave). The hundred and fifty-seventh note is a G25 (second space of the next octave). The hundred and fifty-eighth note is an A25 (third line of the next octave). The hundred and fifty-ninth note is a B25 (third space of the next octave). The hundred and sixtieth note is a C26 (fourth line of the next octave). The hundred and sixty-first note is a D26 (fourth space of the next octave). The hundred and sixty-second note is an E26 (fifth line of the next octave). The hundred and sixty-third note is a F26 (first line of the next octave). The hundred and sixty-fourth note is a G26 (first space of the next octave). The hundred and sixty-fifth note is an A26 (second line of the next octave). The hundred and sixty-sixth note is a B26 (second space of the next octave). The hundred and sixty-seventh note is a C27 (third line of the next octave). The hundred and sixty-eighth note is a D27 (third space of the next octave). The hundred and sixty-ninth note is an E27 (fourth line of the next octave). The hundred and seventieth note is a F27 (fourth space of the next octave). The hundred and seventy-first note is a G27 (fifth line of the next octave). The hundred and seventy-second note is an A27 (first line of the next octave). The hundred and seventy-third note is a B27 (first space of the next octave). The hundred and seventy-fourth note is a C28 (second line of the next octave). The hundred and seventy-fifth note is a D28 (second space of the next octave). The hundred and seventy-sixth note is an E28 (third line of the next octave). The hundred and seventy-seventh note is a F28 (third space of the next octave). The hundred and seventy-eighth note is a G28 (fourth line of the next octave). The hundred and seventy-ninth note is an A28 (fourth space of the next octave). The hundred and eightieth note is a B28 (fifth line of the next octave). The hundred and eighty-first note is a C29 (first line of the next octave). The hundred and eighty-second note is a D29 (first space of the next octave). The hundred and eighty-third note is an E29 (second line of the next octave). The hundred and eighty-fourth note is a F29 (second space of the next octave). The hundred and eighty-fifth note is a G29 (third line of the next octave). The hundred and eighty-sixth note is an A29 (third space of the next octave). The hundred and eighty-seventh note is a B29 (fourth line of the next octave). The hundred and eighty-eighth note is a C30 (fourth space of the next octave). The hundred and eighty-ninth note is a D30 (fifth line of the next octave). The hundred and ninetieth note is an E30 (first line of the next octave). The hundred and ninety-first note is a F30 (first space of the next octave). The hundred and ninety-second note is a G30 (second line of the next octave). The hundred and ninety-third note is an A30 (second space of the next octave). The hundred and ninety-fourth note is a B30 (third line of the next octave). The hundred and ninety-fifth note is a C31 (third space of the next octave). The hundred and ninety-sixth note is a D31 (fourth line of the next octave). The hundred and ninety-seventh note is an E31 (fourth space of the next octave). The hundred and ninety-eighth note is a F31 (fifth line of the next octave). The hundred and ninety-ninth note is a G31 (first line of the next octave). The two hundredth note is an A31 (first space of the next octave). The two hundred and first note is a B31 (second line of the next octave). The two hundred and second note is a C32 (second space of the next octave). The two hundred and third note is a D32 (third line of the next octave). The two hundred and fourth note is an E32 (third space of the next octave). The two hundred and fifth note is a F32 (fourth line of the next octave). The two hundred and sixth note is a G32 (fourth space of the next octave). The two hundred and seventh note is an A32 (fifth line of the next octave). The two hundred and eighth note is a B32 (first line of the next octave). The two hundred and ninth note is a C33 (first space of the next octave). The two hundred and tenth note is a D33 (second line of the next octave). The two hundred and eleventh note is an E33 (second space of the next octave). The two hundred and twelfth note is a F33 (third line of the next octave). The two hundred and thirteenth note is a G33 (third space of the next octave). The two hundred and fourteenth note is an A33 (fourth line of the next octave). The two hundred and fifteenth note is a B33 (fourth space of the next octave). The two hundred and sixteenth note is a C34 (fifth line of the next octave). The two hundred and seventeenth note is a D34 (first line of the next octave). The two hundred and eighteenth note is an E34 (first space of the next octave). The two hundred and nineteenth note is a F34 (second line of the next octave). The two hundred and twentieth note is a G34 (second space of the next octave). The two hundred and twenty-first note is an A34 (third line of the next octave). The two hundred and twenty-second note is a B34 (third space of the next octave). The two hundred and twenty-third note is a C35 (fourth line of the next octave). The two hundred and twenty-fourth note is a D35 (fourth space of the next octave). The two hundred and twenty-fifth note is an E35 (fifth line of the next octave). The two hundred and twenty-sixth note is a F35 (first line of

 mf

15

Musical notation for measure 15, featuring a treble clef and a series of eighth and sixteenth notes with various accidentals.

[illegible]

loco

25 *loco*



30

Musical notation for measure 30. The staff begins with a treble clef and a key signature of two sharps (F# and C#). The melody consists of eighth notes and quarter notes, with some notes beamed together. There are bar lines at the beginning and end of the measure.

mp

35

35

[illegible][illegible]