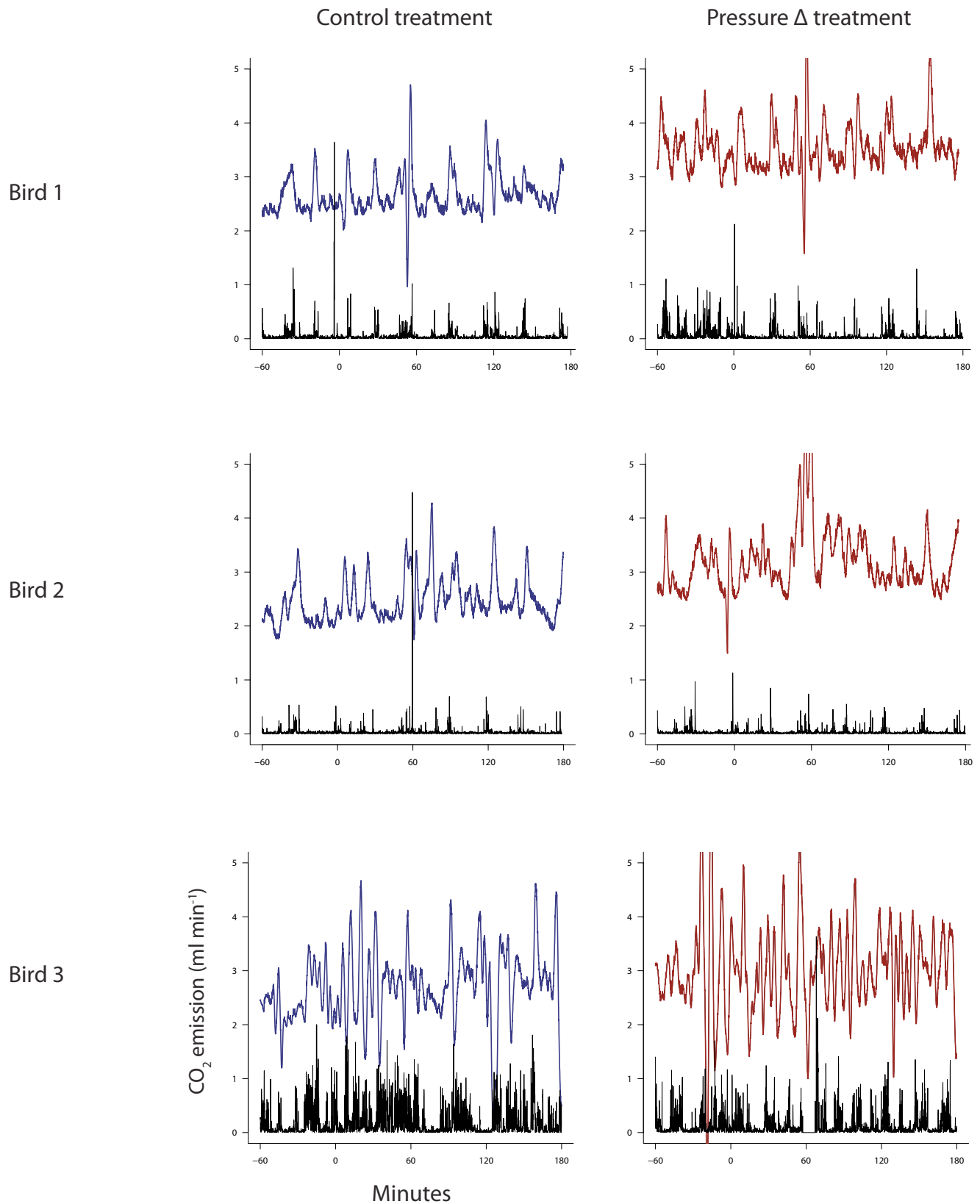
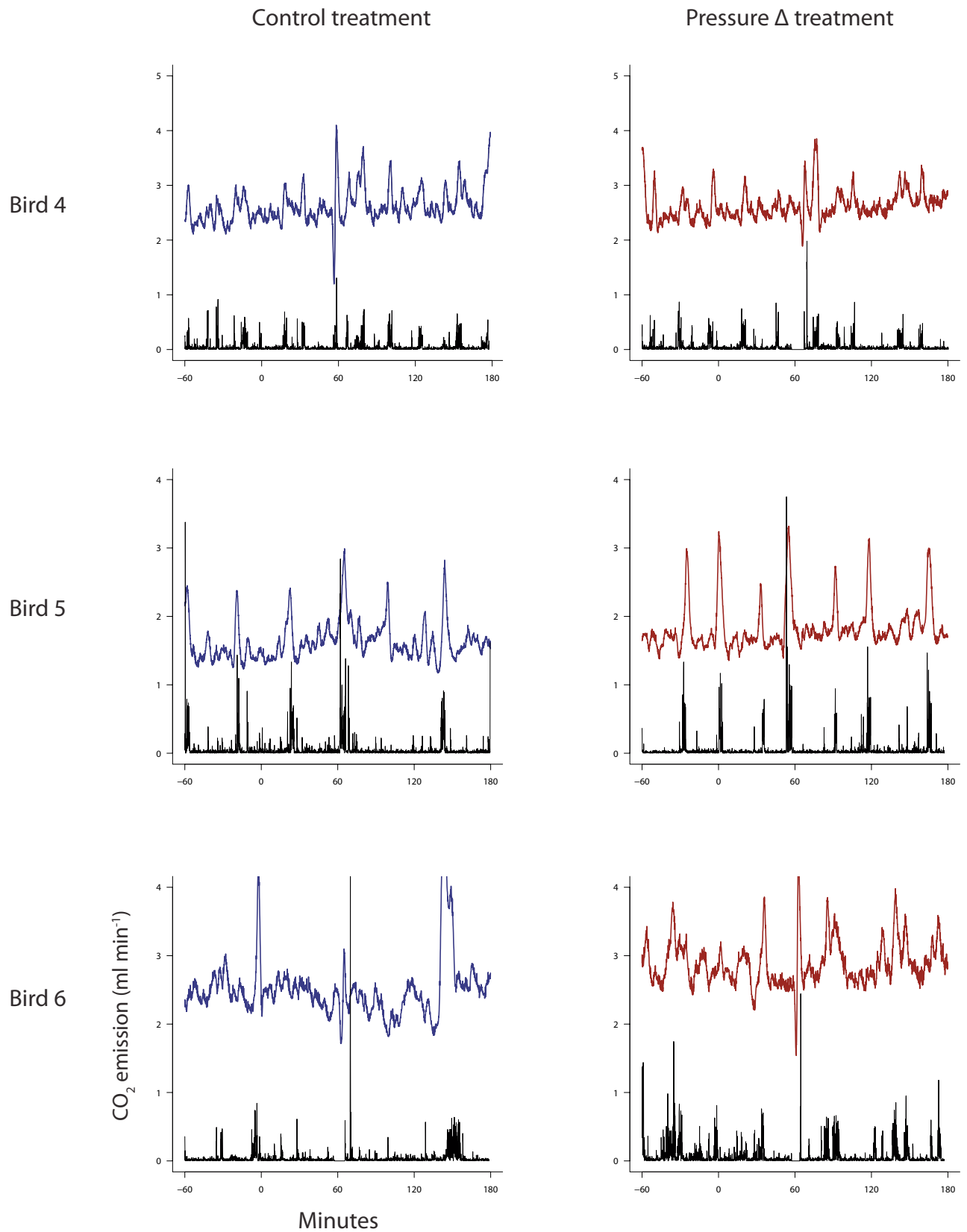


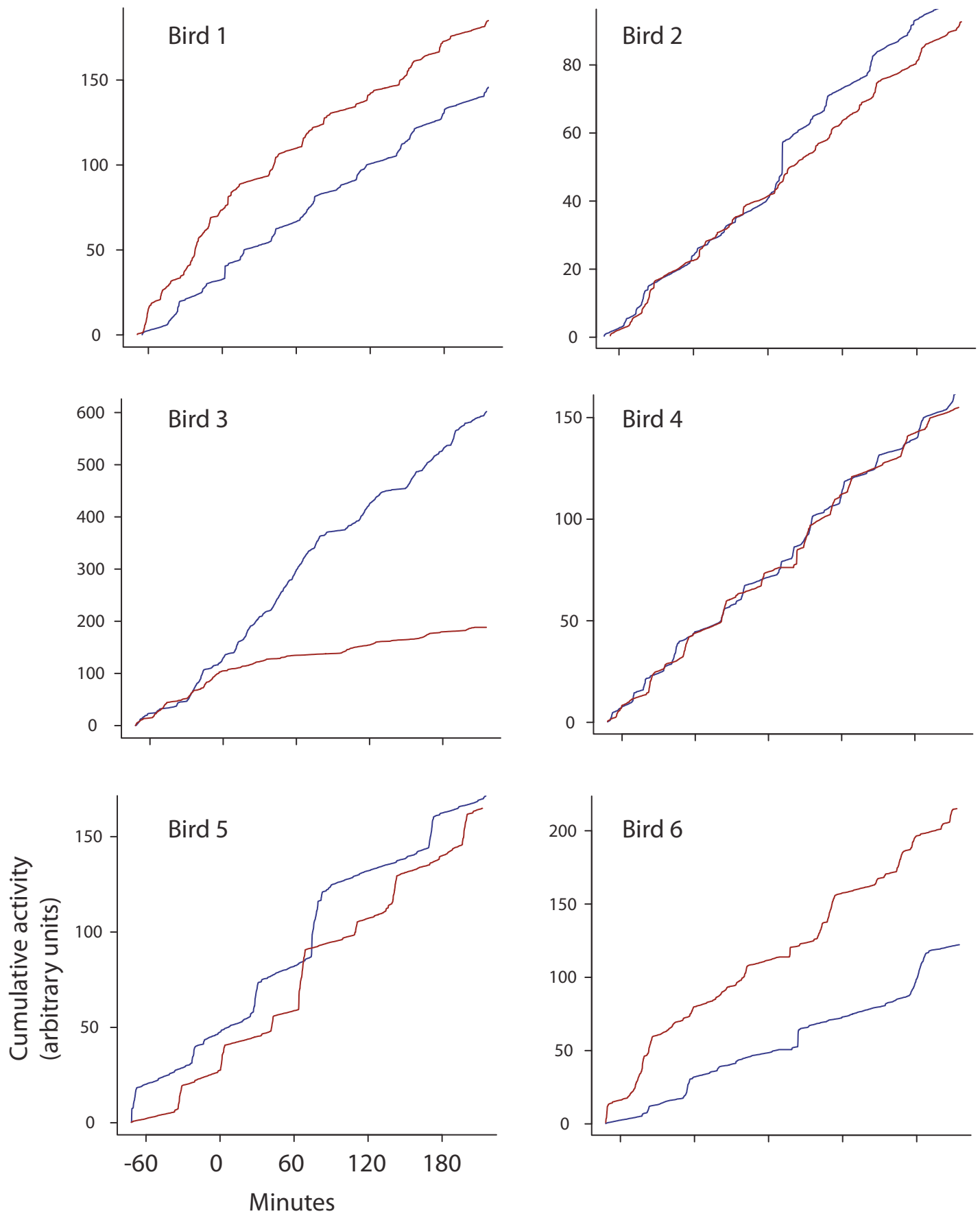
**Fig. S1.** Mean image pixel value over the course of Movie 2. The script generating these data is given in Appendix S1. Greater pixel values mean that more pixels differed between one frame and the next, indicating larger movements by the bird.



**Fig. S2.** Rates of CO<sub>2</sub> emission for birds in their control (blue) or pressure (red) treatment. Corresponding behavioral traces, from the pixel-based method of video analysis, are plotted below each metabolic trace. Data from the second set of three birds is shown in Fig. S3.



**Fig. S3.** Continuation of the data shown in Fig. S2.



**Fig. S4.** Cumulative activity plots from the pixel-based video method. Each bird's data is shown in a single plot, in both blue (control) and red (pressure).



**Movie 1.** Video of 400 s of a white-crowned sparrow. Frames were extracted ( $1 \text{ frame s}^{-1}$ ) from the original  $30 \text{ frames s}^{-1}$  digital video, and they are played back at  $8 \text{ frames s}^{-1}$  here ( $8\times$  compression of time).



**Movie 2.** Video of the same 400 s but after the file (Movie 1) was processed in ImageJ using the script shown in Appendix S1. Each time the bird moves, the difference between its position in the current *versus* the prior frames shows up as white pixels. The script also calculates the mean pixel value of the entire frame and outputs it to a text file. The data for this video segment is plotted in Fig. S1.

**Appendix S1.** ImageJ script used to process videos.

```
function processbird(path){
  rename("A");
  stacksize = nSlices;
  run("Z Project...", "start=1 stop=&stacksize projection=[Max Intensity]");
  rename("Z");
  imageCalculator("Difference create stack", "A", "Z");
  rename("B");
  imageCalculator("Copy create stack", "B", "B");
  rename("C");
  selectWindow("B");
  run("Delete Slice");
  selectWindow("C");
  setSlice(stacksize);
  run("Delete Slice");
  imageCalculator("Difference create stack", "B", "C");

  run("Add to Manager");
  makeRectangle(3, 2, 357, 238);
  roiManager("Add");
  roiManager("Multi Measure");
  saveAs("Results", path+"results.txt");
  if (isOpen("Results")) {
    selectWindow("Results");
    run("Clear Results");
    run("Close");
  }
  selectWindow("ROI Manager");
  run("Close");
  selectWindow("A");
  run("Close");
  selectWindow("B");
  run("Close");
  selectWindow("Result of B");
  run("Close");
  selectWindow("C");
  run("Close");
  selectWindow("Z");
  run("Close");
};

sc=50;//this switch sets image size to 50%, which saves a lot of memory
path="C:/Users/john.doe/Desktop/yourimages/";
run("Image Sequence...", "open=&path scale=&sc sort");
processbird(path);
```

**Appendix S1.** ImageJ script used to process videos.