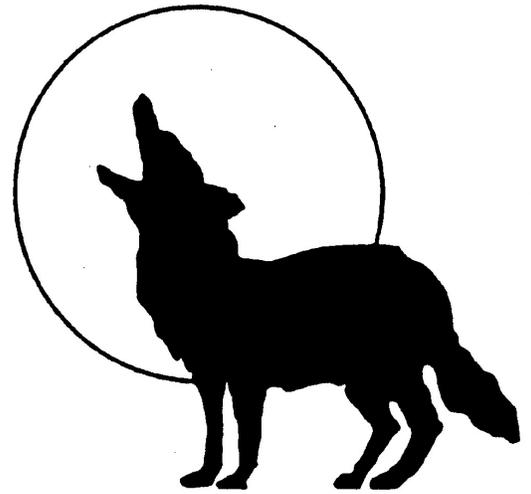


NATURE SOUNDS



The Bulletin of the Nature Sounds Society



FEATURING:

Hempton Interview
Field Recording Guide
To Playback or Not to Playback
Seasonal Recording Calendar

Winter 2001

The Nature Sounds Society (NSS or the Society) is a world-wide, non-profit organization dedicated to the preservation, appreciation and creative use of natural sounds. The **Society** promotes education on technological, scientific and aesthetic aspects of nature sounds through innovative programs, activities and a diverse network of contacts. The membership includes naturalists, bird watchers, recordists, musicians, scientists and artists. Dues categories (in U.S. \$ per year) are: Individual - \$25, Organization - \$40 and Lifetime - \$250 (one time) payable to the Nature Sounds Society, c/o The Oakland Museum of California, 1000 Oak Street, Oakland, CA 94607. Members receive the *Bulletin* and notices of field trips, lectures, workshops and meetings.

The Bulletin of the Nature Sounds Society is edited by Sharon Perry and is produced by Richard Doell. The *Bulletin* welcomes manuscripts on all aspects of nature sounds, including reviews of products and recordings, technical matters, and news of recordists, sound artists, and all others involved with nature sounds. Manuscripts may be submitted to Sharon Perry, P. O. Box 661, El Cerrito, CA 94530; e-mail editor@naresounds.org. Manuscripts are preferably received on diskette or by e-mail in WordPerfect or Microsoft Word formats, but hard copy will be accepted. Line drawings and black and white photographs are appropriate, as well. Style follows this issue. The views and opinions expressed in the *Bulletin* are those of the authors and not necessarily those of the Society. All material contained herein is the property of the authors and/or The Nature Sounds Society and may not be reproduced without permission.

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Cover: Jay Salter and Gordon Hempton recording surf at Rialto Beach, Olympic Peninsula, Washington.
Photography by Susan Manchester.

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Winter 2001

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BULLETIN OF THE NATURE SOUNDS SOCIETY

WINTER 2001

Interview with Gordon Hempton

Jay Salter

Gordon Hempton is one of the world's leading sound recordists, noted both for the profound sense of place he evokes in his many binaural recordings of wild nature, as well as his relentless advocacy for quietude, as found in his campaign for "One Square Inch of Silence" in the National Parks. The following interview with Gordon took place at his home near Port Angeles, Washington, on the night of September 24, 2001. The interviewer is Jay Salter, sound recordist, and writer for *Nature Sounds*. The interviewer's questions are set in small caps font and his descriptions appear in side bar italics.

WE'RE WITH GORDON HEMPTON THE 24TH OF SEPT., 9:35 PM. I'M WONDERING, GORDON, IF YOU WOULD DESCRIBE THE SOUNDSCAPE HERE?

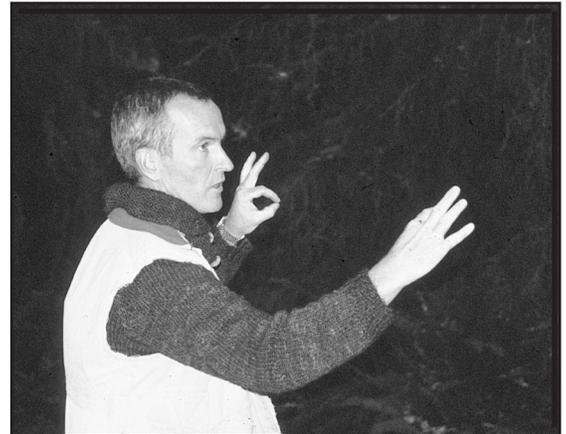
Standing outside at night, under the quiet ceiling of overcast that stretches from the nearby Olympic foothills, over the trees and pastures before us, to the highway, then over the Straits to Vancouver Island: one huge acoustic space resonating in the darkness.

Well, you know it's pretty phenomenal when a person can live in an area that is quiet as this place, and still have it be settled. Because when you think that, well, now that that car has traveled down the highway, and the highway itself sees only one or two cars every five minutes, the nearest sound

that I'm hearing is easily miles away. I take that back. A plane just started, didn't it, so it will be interesting to see what the next event is. But before that, we were hearing the foghorns, and I'm fairly certain that the foghorns

Sound of deep foghorn speaking distantly under overcast were out in the shipping channel, and that's easily eight miles distance and possibly further since we're hearing it at such a low level.

As few flights as we get over the North Olympic Peninsula, because we are in one of the quietest places of the whole United States – we don't have the transcontinental flights that a lot of areas see -- we do have the transpacific



Gordon Hempton

flights, a few of them, and they have different noise standards. So while we have few noise intrusions, they're usually quite severe.

You know what's interesting about tonight, is that just as my eyes are beginning to adjust and we haven't turned on the flashlight in five minutes or so, my ears are beginning to adjust. And when you and I walked out, we looked at each other and we both said: "Profound!" It's like a jinx, I guess! Because a few minutes later and both our eyes and ears are adjusting, and I'm still waiting for [the plane sound] to stop so I can hear.

Foghorn resonant in returning stillness.

You know one of the most interesting things about tonight's soundscape is that there is not a leaf turning anywhere. And this is fall. And not only are the falls often windy, and the fall forest easy to make sound, right, because it is the spring leaves that are silent and the fall leaves that aren't, at least in this part of the country.

But it is absolutely still, which is pretty exciting, because tomorrow morning at dawn all the layers should set up real nice and sound will travel even further.

Here we are, here we are: we're coming up to it:

Long silence.... Hmm. You know it's a night like *distant foghorn....* tonight that reminds me of the Bushmen on the Kalahari. They can do such beautiful petroglyphs because they know the animal by just the bare silhouette on the horizon. As tonight, when things are just so quiet. And it was like that bare silhouette of sound of a frog, which I swear had to be a half mile away—I know it sounds absurd—but it was down in that direction. And it borders on the threshold of my experience, and it helps me to define just what exactly I hear in the frog's voice.

IT'S INTERESTING YOU REFER TO THE KALAHARI BUSHMEN AND THEIR PETROGLYPHS. I'M THINKING OF YOUR TITLE "THE SOUND TRACKER." IT'S A VERY EVOCATIVE PHRASE. IT'S A VERY EVOCATIVE TITLE TO GIVE YOURSELF, AND I WONDER ABOUT THE EXTENT TO WHICH THE OLD SPIRITUAL DISCIPLINE OF HUNTING HAS INFLUENCED THE WAY YOU APPROACH YOUR WORK.

You know, to tell you the truth, I don't know how I got the name, "The SoundTracker." I gave it to myself, of course, but somehow it was just so self-evident, it seemed so natural, that I just picked it up and it never left me. The part about the tracking that feels so natural to me, is that sound is by and large something that I have to go out and find. Because if you go out to record something, by the time you've heard it, it's too late, unless you're already running tape. So you can't run tape and wear down batteries and run up huge expenses by nonstop recording. But you do pick up clues about your environment and the patterns in sound, and then choose your locations wisely. And even though you don't know what you will in fact hear, I do feel like I have learned a lot of skills in

finding the places that I know will produce beautiful sound.

THROUGH THE EXPERIENCE OF NOT ONLY HAVING GONE OUT YEAR AFTER YEAR, BUT ALSO YEAR AFTER YEAR TO THE SAME PARTICULAR PLACES?

Right. There are places like Rialto Beach that keep bringing me back. There's a part of me, of course, that hopes I'll find that one sound I didn't quite get enough of, but I never do. The beach is constantly changing and there's something new. And I don't think that Rialto Beach has ever disappointed me. That's another good reason to go there. It's always told me a little bit more about myself. I really think that nature-discovery is self-discovery. It's really very little more than that, because it's something that, the longer that I'm there listening, the more I understand it's really inseparable. The terminology that I want to use to divide the world, and which the sciences taught me in graduate school, just doesn't apply as a listener. And that's probably what makes the experience so passionate for so many people: our language fails us because it does divide the environment, and sound unifies. Everything comes together from the point of listening.

And this point, here, is really quite astounding, since you can see all the way across to Canada. And then you can look to the south and see the foothills of the Olympics and then beyond. And it is so quiet even though within an hour's drive from where we're standing right now we have everything from rainforest to alpine to ocean beach. That's pretty hard to find.

IT IS. AND YOU HAVE LIVED IN THIS AREA FOR SOME TIME NOW, THE PORT ANGELES AREA.

It seems like such a short time. But I have actually been recording here on the Olympic Peninsula for twenty years and it was the first place that I ever recorded as a nature sound recordist. And it was the last place I recorded just this last week. And I think it was with just as much enthusiasm. Except, I noticed that when I went to record -- and this is one of the things I really enjoy about listening -- what I went to hear was the elk; and sure the elk were there, but it was not what held my attention the most. The wind was rustling, just the uppermost leaves of the alder trees, before the leaves drop, and the leaves mix with the grasses. And that's why the elk are there, because it's kind of

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like the fall candy, they love to eat that. So: the fall leaves in the treetops -- it's beautiful -- and in the forest, the way the sound, in particular the elk bugle, travels through the forest, and the echo that travels on and on.... Now listen to that:

*Distant dog bark
reverberating
under cloud canopy
and against barn*

Now that dog... [Laughter] That dog has to be the dumbest dog. Only because I was listening to him the other night, and I think his echo got him all excited. Even though he is over a quarter mile away, I swear I was hearing the echo bounce off the barn here, and the echo was so loud. And then, given time for it to travel back to him, the distance it took, he got real excited. He wouldn't let up. He was driving me nuts!

WHAT CHANGES HAVE YOU SEEN IN THE LANDSCAPE IN THE TWENTY YEARS YOU'VE BEEN HERE?

When I first came here a lot of old growth was still being cut. In fact most logging trucks were carrying old growth to market. One, two, possibly three logs per truck. Massive trees. And today it's only sticks by comparison. None of the old growth is being cut anymore. And that only begins to tell the story, because twenty years ago you could find an old growth forest and listen to some beautiful concerts that are simply gone today. They cannot be found. And sure, you can say we do have the National Parks where we have the old growth forest, but we have the old growth forest at higher elevations, which is very different than the music you hear in the lower elevations. And also the acoustics of the shore, particularly along the Straits, are quite different than the interior. And they're gone.

Another thing I've noticed is that twenty years ago while I was recording I'd run into someone and they'd ask me a few questions because they'd never seen a guy holding a plastic head on a tripod. And even though I'd tell them what I was doing, they still wouldn't listen and hear what I was doing. They kept thinking I was taking pictures or something, while they were sizing me up for being some sort of And then they'd finally ask me what I did for a living. And I'd tell them I do this for a living. [Laughter] And they wouldn't believe it. Also when I'd talk to them about noise intrusions and how difficult it is to find a quiet place, then

they thought I was even stranger. The quiet places seemed to be only a concept then. And today I think that I can just raise the topic of nature sounds and listening to a person, and they'll start talking about noise, and how difficult it is. So that's been a real significant cultural change.

THE AWARENESS HAS GROWN BUT UNFORTUNATELY THOSE PLACES OF PRIMAL MUSIC HAVE DISAPPEARED.

Yes, I think that this is something that happens with a lot of natural resources and quality of life. We have to breathe smog before we get the clean air. We have to taste the chlorine in our water, and take a look and see that there is actually algae coming out of the tap, before we begin to take an interest in paying the higher price of water filtration systems. And also looking at different point sources of pollution

and also no point sources of pollution. I don't view it as a tragedy. I think it's wonderful thing, because it helps clarify what it



Jay Salter recording at Rialto Beach

is we value in life. And I think that the fact that quiet places are becoming increasingly more important helps to affirm to everyone that it is an essential quality of life. And it's not like we took it for granted before, but it was so basic to our existence that we didn't even need to discuss it.

YOU'VE BEEN WORKING WITH THE NATIONAL PARKS FOR LESS NOISE POLLUTION?

I've been very interested in quiet places preserved

in the National Parks system, and also particularly here in Olympic National Park where I like to think of it as being the listener's Yosemite. I'm in the fortunate situation of being a telecommuter, so I could actually live anywhere in the world, and I choose to live here just for the beauty that it affords. It's real important to me.

I have developed a sound survey and a whole methodology and strategy for preserving quiet places here at Olympic. But your question was that I am working with the National Park? I think the real answer is that the National Park Service at the higher levels considers me a nuisance. I think that in their most private moments they might describe me as a "foamer," because I actually talk about quiet being quiet. I'm not setting standards for "noise levels" that would define quiet. It was not more than ten years ago that the National Park Service defined "quiet" as the absence of human sounds, of noise intrusions. That it was only the sounds of nature. And that this was the standard for the wilderness areas in the National Park. And yet now they find themselves in the situation -- the main method of which I can determine they can restore quiet to the Parks -- of redefining what quiet means, as containing a certain allowable amount of noise. And who sets those standards? Frankly, I think that they are unqualified to do so. I think the only qualified person to really set the standards of our National Parks would be the Parks themselves in their most natural state. I think we cannot forget the very reasons why the National Parks are here. They aren't versions of urban parks on a grand scale. You know, these are really the portals to the soul. And we need to have them untainted by our poor choices that we make today. We share this common timeless quality with existence, which generations before us have.

It's really not easy to even.... You know it's almost discouraging to even talk about it. Discouraging in the sense that it cannot be described. It can only be experienced. So in the field of acoustic ecology you do have two types of people: one that has experienced it, so that they share this common understanding and know what it is they they're working towards. And those that haven't experienced it, and they're just working with concepts. And often they're wearing National Park Service uniforms. And the problem they're working on is a problem of their job description and what it is they're supposed to do.

I think that there has probably never been a greater time in the history of the National Park Service where they have been in such a spiritual crisis. I think that sums it up: the National Park Service is in a spiritual crisis. And what makes it a crisis is that key decisions, such as real quietude, preservation strategies, are being made in noisy rooms, with all kinds of technological intrusions, rather than in the quiet places themselves in the back country where they can receive larger thoughts than what they are able to really think up by themselves.

I think there is a greater intelligence contained in the land than we contain in our thoughts. And when we can be in a quiet place we can tap into that. And when the question has been well stated, the answer is there too. I don't think that we've really asked ourselves the right questions yet as far as quiet places' preservation. The question has less to do with how we need to manage our Parks, than how it is we need to manage our life styles. And how much fossil fuels are we willing to feed this bomb? This bomb that continues to shock our lives with change and velocity.

You see? Why do they call me a foamer? [**Laughter**] Is that what they mean when these little bubbles appear on the side of my mouth?

I do want to say one thing more before we get back to this expansive quiet. You know, my "One Square Inch of Silence" has been criticized by the National Park Service as not being a practical solution. And I've asked them to explain what about it is not practical. Because, after all, sound travels for miles, right? And it impacts. And it is hard to control. It bounces off walls, goes through vegetation twenty-four hours a day, etc. And so to manage a soundscape sounds like an impossible task. Though here we are standing at the top of this hill and we can hear for miles. So just as we can think about noise impacts around airports, we can also think about, if you will, quiet impacts. If we can preserve one square inch of silence in a national park, the impact of that quiet extends for many square miles over the whole park. That point strategy management approach is not only the most effective way of managing the soundscape but also the only way we will be able to manage it.

ONE OF THE WAYS I THINK OF YOUR WORK IS AS THE FIELD WORK OF SOMEONE WHO IS AN ARCHEOLOGIST OF PRIMAL SOUNDSCAPES, AS FOUND IN

Indoors now. Warm, soft light. Resonance of voice on wooden walls and floor mixing with clock tick, refrigerator hum, and the immense stillness outside.

YOUR PROJECTS TO RECORD WHAT, FOR INSTANCE, MUIR MIGHT HAVE HEARD, AND WHAT SETTLERS HAD EXPERIENCED, AS WELL AS THE ABORIGINAL INHABITANTS. IS THIS A FAIR TERM, "ARCHEOLOGIST OF PRIMAL SOUNDSCAPES?" AND IS

THIS CONNECTED WITH WHAT WE SEE IN OTHER DISCIPLINES: THE QUEST FOR THE WILD, THE UNDOMESTICATED, AND THE UNSPOILED?

I'm still listening to your questions. I think that they're interesting. I am real hesitant to agree that my work comes under any terminology, as much as I am also a little bit offended when species are named in a nature recording. Because, after all, very infrequently are musical instruments mentioned in music that we listen to. And I think that in both my work and my recordings—my activity and the result of that activity—I try to keep as wild as possible. I try to abandon my language and thinking in English as soon as possible [upon arriving to record]. Which used to take ten days on an average. And now, after so much practice getting to know myself and trusting that way of feeling, can take anywhere from two hours, to a day and a half. And that's one of the reasons I don't write much in the way of liner notes with these pieces, because I experienced it as a wilderness. I like experiencing it as music undescribed; and I like to hand it to my audience in the same way that I enjoy it. I also don't listen to the radio if the music is being interrupted with a lot of commentary about it. And I also don't read the liner notes, to tell you truth, of the albums I buy. That's pretty much the sonic reality.

I have recognized though, in the trusting of my instincts, that I had deceived myself for decades, while as a student, about ways of knowing, of ways of knowledge, and ways at arriving at meaning. Not only in my personal life but meaningful direction in my career, which would be rewarding to society as much as to myself. And I felt that in many ways a lot of my exposure to media, television, radio, newspapers, and reading books, as well

as studying textbooks and listening to lectures, had corrupted me. That this was a kind of academic industrial noise pollution into my soul. And that there were people in our American history who had sort of predated this pollution. John Muir [was] one of them. Mark Twain, another. And others who I felt that I wanted to accelerate my advancement to a feral state. And sure enough, that was very true. I started reading the works of these people. And while I had read some of it before, I was definitely listening to their words with a whole different attitude. And understanding that John Muir's descriptions were not poetic but literal truths, as scientific as any writings, and very observant. But they did not speak to an audience. I think that John Muir particularly had to confess, he really had to confess just how beautiful.... Because, after all, he wasn't that popular until later in his life. Earlier in his life, evading the Civil War, because the Civil War brought the first draft, and feeling that the violence was not good, and being a vegetarian and really compassionate for animals. This was all part of my listening to someone for the first time. I had these teachers, and while they were long gone, I think that they were on the

same path I felt was important for me to take, and that they were more skilled at it, started earlier in life than I did, and were also in a world that was speaking clearer than it is today.

So with all those advantages it was really impossible for me not to just absorb myself in these works from American history. So I spent two years on each one of these people so I could

spend the time that I needed to almost assume the character, though I never lost myself in them. And then I think most recently my need to be isolated has evolved out of that continued direction, where: OK, I'm not Muir, I'm not Twain, I'm not anybody except who I am. And whoever that person is, whoever the Sound Tracker is, will be the life that I



Jay Salter and Gordon Hempton in Ho River Valley

live. And I think it's contrary to what I would have assumed ten years ago, where I could have quickly painted you a picture who the Sound Tracker was. You know: the Sound Tracker is going to be a person who publishes CDs, who wants to compose masterpieces, and wants to collect vanishing sounds, and license this, and wants to be a pioneer in the field. And I don't think I want to do any of that any more. I think that what I really want to do is live a real and genuine life in nature, and to experience for the benefit of people that I know and for myself, my children, and my friends, something that cannot be described in any other way than truths. Undeniable, undebatable truths. There's a reality that does exist. And that reality is something that is very clear to perceive. But I will add to that, it is not easily perceived. It is clear to perceive but not easily perceived because there are so many distractions. And we do live inside of an explosion. There's no question about that.

LITTLE IF ANY HUMAN SOUND OCCURS IN YOUR NATURE SOUND RECORDINGS. IS THIS AN AESTHETIC DECISION?

I think it is an aesthetic decision. It's the same decision that I think many audio engineers make when they decide to soundproof the studio so that the highway traffic doesn't intrude in the background of their sound recording of a band, of a musical performance. Because a song is something that is very intentionally composed, and created, and so only meaningful elements should contribute to it. Even if it is a chaotic expression within the music, all of it belongs there, for one reason or another. It all works together. I've never been able to particularly find a recording opportunity where I felt that the sounds of human activity were anything but just coincidental events. Whereas the sounds of nature are, for me, not coincidental. They're rhythmic, they all work together, they exist there because also the other sounds exist there, through a lot of the resource partitioning that we find, and a lot of other parts of ecosystems analysis.

My background is in plant pathology. So in the study of plant diseases and integrated pest management in an agricultural situation, you can see the same kind of dynamics going on in a natural community where the music is evolving, and getting better and better. One of my favorite analogies is that the earth is a solar-powered jukebox. And so the areas that receive the most sunlight, provided

that there is also water available to support life, those ecosystems have a greater amount of photosynthesis, and as a result more energy to power the sound of the community. So that when we get into the tropical areas where glaciation hasn't devastated the environment, and in places where logging has not occurred, the expression is very symphonic. OK, now try to find a human activity that in the tropics, let's say, you could equate with symphonic expression. And you would be able to among, say, the songs of the aboriginal peoples. But that is so often not even accessible to a sound recordist. And certainly here in the temperate latitudes it's nearly impossible.

But I have recorded aboriginals in Australia, in North America, in many places, and I enjoy it, But there is an underlying need I have in the expression of my work, that what I find and what I record cannot be too intentional. And so, certainly if I were to come across a native people performing some cultural event unarranged for my benefit, then I think that I would include that. And certainly if you listen very closely to the very distant of the Misty Isle of the Quiet Places Collection you will hear the villagers snoring. Now how is that possible? Because you don't hear dogs barking, you don't hear electricity going on. Can you imagine sleeping to that music? You'd sleep musically too. The snoring is just so beautiful. And it blends into the background. It's almost imperceptible. But if you listen closely you can hear it.

I don't want to be too long-winded about this, but I'm not opposed philosophically to human expression being in a natural environment. I believe that we are fundamentally members of nature. It's just that I hear it so seldom. I hear it so seldom. And I try to deliver music.

INDIGENOUS PEOPLE, OR PEOPLE WHO HAVE LIVED CLOSE TO THE LAND FOR SOME TIME, OFTEN WORK IN SYNC WITH THE LAND, IN THAT THEY SING THEIR WORK SONGS, OR WHATEVER, DRAWING FROM THE MOTIFS, MUSICAL MOTIFS, ONE MIGHT SAY, IN NATURE...

Well, I would go a step further. I'd say that they're not just drawing on the music of nature. But they are in many ways reenactments of nature refined over time.

THAT BRINGS ME TO THE NEXT QUESTION. MANY

HEMPTON INTERVIEW

ANTHROPOLOGISTS BELIEVE THAT THE ORIGINS OF ART ARE MIMETIC-- HUMANS TRYING TO REPRODUCE THE SOUNDS, MOVEMENTS, AND FORMS OF ANIMALS IN ORDER TO APPREHEND THEM: TO LEARN FROM THEM, TO HONOR THEM, TO HUNT THEM, TO EAT THEM, TO BE ONE WITH THEM. IN THAT WAY, DANCE, SONG AND STORY MIGHT BE SAID TO "RECORD" THE LIVES OF ANIMALS. COULD MIMESIS BE ANOTHER WAY OF SPEAKING ABOUT YOUR APPROACH TO RECORDING?

I don't know. I hadn't thought about it in that way. But I can truly say, that when I have been in a place long enough and recorded it, that I literally feel undivided from it. I'm in the back country alone, sometimes for weeks. And I never see myself. Oh sure, I see my boots and I see my hands, but I never see my face. And that just de-emphasizes my presence more and more. And so I begin to feel practically invisible. And because, when I listen, I listen 360 degrees, as we all do when we are really listening, there is no division, which sight often creates. You know: one object in front of another, or just in one direction, instead of all around. And so I think that maybe part of the enjoyment of being a listener and recording sounds is to perhaps to learn so much about a place that it is no longer separate from you. Yes, to take it [in the way you speak of] might be great.

But I also have trouble with listening to the way our language structures its questions. Because it seems often that we do something, and therefore animals must do something for a reason. And that this reason somehow connects with some essential requirement to live a successful life. Whether it's to perpetuate the species through reproduction, or you name it. And you know, the more that I listen, the more that I'm there, I think that wildlife is just as vulnerable as myself to practically idle curiosities. Jokes, fun, culture. You know, sometimes I think that the birds that I'm listening to are a lot less serious about life than I am. And that's quite refreshing. [Laughter]

YOU'VE SPOKEN OF REALIZING AT ONE POINT, THAT IT WASN'T SO MUCH THE SOUND YOU WERE INTERESTED IN, AS IT WAS THE WAY SOUND GIVES YOU A SENSE OF THE PLACE.

It's really clear to me that I'm not that much interested in sound, if we're going to create an order of importance here. But I am interested in feeling

the space around me. There's a wonderful vitality that's expressed in just the textures of space floating around you in the night wind that brushes across your face while you're sleeping on the ground. And you know, I can have a wonderful experience even when there's no sound. In fact, I can just eat it up -- it's just delicious stuff. It's not sound that I'm interested in. And as a very specific example of that is a recording of silence I made up the Hoh Valley in Olympic National Park. And if you were to listen to the recording, you'd say, "Well, this is a recording of frogs. And the frogs are only sometimes croaking." You know, the frogs are needed to define the space. And it's the way the voice carries, and is actually sweetened, and made more interesting, in my opinion, as a result of having traveled through a distance, and rebounded off the trees, and being brought to me, and then carried on. And the size of the space is to me also immensely important. I think that the wilderness character is measured in many square miles, and that the expansive spaces of which pioneers, when they made it to the horizon and saw the next view, and experienced the next world beyond, and the future, their uncertain future... It was really a sacred experience.

And it allowed me to understand. That is, I don't believe, as some historians do, that the pioneers were in search of a conquest of nature. No, I see it as a part of a fulfillment of their life. In Yosemite I used to eat the fish out of the streams as it helped to lighten my load, because I was carrying two sets of gear up the side of Mt. Lyell. And I remember how thankful I was to the fish, and how admiring of its beauty. As I would then kill it, and put it on a stick and cook it over a fire. And I don't think I was in any way conquering. But I was truly honoring it. And I was well aware that it was the fish that carried me up the mountain, not me.

WHEN YOU ARE RECORDING AND YOU ARRIVE AT, SAY, A NEW LOCALE, WHAT HAPPENS, IDEALLY?

Let's create some additions to the question: "And the result of the trip will be that I make one of my best recordings ever. What probably happened?" I have come there for a reason. That's essential. But there is a point, and hopefully it will be crossed soon, upon arrival, that I have to abandon those reasons. Because I've never been there before. And often it's so traumatic... I realize it could be a total wash. I mean, I might have spent all this money, or made all these promises, and I'm not going to be

able to do what I thought I could do. I can remember in eastern Washington wandering around the hills for hours weeping and crying and just delirious. And I didn't even know why. And I didn't even know why. But I knew that I just needed to be who I was, and trust the feelings that I would have. And I've since recognized that this is sort of a shower that my soul takes to clean off all the expectations, to finally arrive at the location. In a genuine sense. And that when that's over with, I'm really listening. I'm not listening for anything. I'm listening to where I am. And it's then that I begin to tune in on what makes that place different from all other places that I've been. And that helps guide me towards setting up my equipment to capture what it means to be there and nowhere else.

Yes, it's very essential. And I like to share that story, often with students that I've taught at Olympic Park Institute, because sometimes a student obviously will go and take that course because they hope to become a much better sound recordist. And it helps them sometimes to understand: a) it's not that easy, and b) they're not going to achieve what they thought they were going to achieve. And gradually it builds on them that they may in fact not be able to do what they thought they would be able to do. And that's a beautiful point to be at. They're actually among my best students ever, because they face that. And let go of that. And be where they are.

THIS IS A THEME YOU KEEP RETURNING TO: COMING TO AN EXPERIENCE WITH FRESH EARS, AND BEING HUMBLE IN THE FACE OF IT. I'M THINKING ABOUT CERTAIN SPIRITUAL PATHS LIKE, SAY, ZEN OR QUAKERISM, WHERE ONE GOES BEYOND THE CONCEPT TO THE DIRECT EXPERIENCE. BEING QUIET ENOUGH TO REALLY HEAR, IS WHERE WE NEED TO BE. HAVE YOU BEEN INFLUENCED BY ANY SUCH SPIRITUAL PATHS?

Not that I know of. I try to stay as uninformed by religion as possible. Not because I don't think they're valid, or that they shouldn't be believed in. But it's because I feel so well connected with the experiences I am having, that I couldn't imagine learning anything more clearly than how I'm

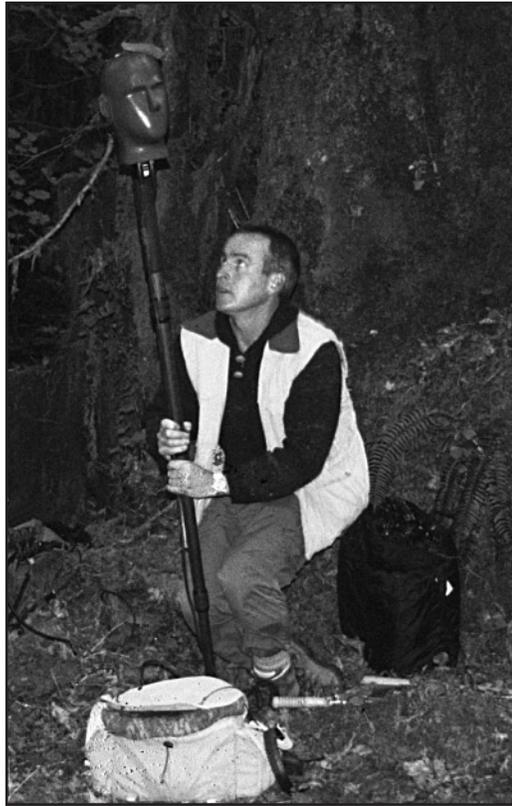
learning it now. I don't feel that I need to go outside of the immediate experience to gain other perspectives. Though I expect sometime in my life I will. Or at least I leave that open, and I'll know when the time is right.

YOU ARE A FORTUNATE MAN TO HAVE FOUND HIS PATH. AND I'M WONDERING WHAT LED YOU TO IT, BECAUSE I KNOW YOU DIDN'T START RECORDING UNTIL YOU WERE IN YOUR LATE TWENTIES.

At twenty-seven I started recording. And actually it happened pretty suddenly. I guess the best way of telling the story... I thought I was a good listener when in fact I was a very poor listener. And the fact that I thought I was a good listener, was supported by the fact that I played a musical instrument,

that I was a straight A student and took great lecture notes, that I could have fairly involved conversations with other students and my professors, and so I must have been a good listener. To add to this, it was also that I was studying not just botany as an undergraduate, but terrestrial plant ecology, particularly of alpine areas. So I spent most of my field experience in wilderness areas. Yet I can hardly describe a sound to you that I heard during that entire time.

So, I was such a terrible listener, and held in that position by thinking I was a good listener, that the fateful day came when I would have this accident in which, through no intention of my own, I did listen. And that was on my way back to Madison for graduate school in plant pathology, and I had spent hours and hours on the interstate trying to



Gordon Hempton with binaural mics

do one of these non-stops from Seattle to Madison. You know: get there. I just couldn't drive any further, and I pulled over, and lay down, as students do, not in a motel, but on the ground in a place I thought nobody would disturb me. And a thunderstorm arrived, and rolled over me. And whether it was the exhaustion from the road or just the magic of the experience, there was not a thought in me. But when the experience was over, I was just stunned by the undeniable fact that I was twenty-seven years old, and I had never truly heard a thunderstorm.

But still slow to catch on here, slow to catch on. I didn't think it was going to change my life. I mean, I had plans. So I continued on the plans. But phase two was that I went into an electronics store, and handed them my driver's license, and they set me up with some recording equipment, and I walked out of the store totally wired, onto the street, and heard the same world that I had walked through to get to the store, entirely differently. And I said, this is it. This is my tool. This is my scuba gear, or whatever you want to compare it to, that I was finally going to be able to experience the world around me with, or at least train myself to. And it changed my world, and I knew it had right then, that it had changed it. It did.

So I left graduate school. Things got immediately worse. Things got very desperate. Burdened by debt, I went commercial fishing in Alaska, broke my hand, and then finally took a job as a bike messenger, still with only one purpose in mind: to purchase some sound equipment and continue listening. And that was it. And I've never wavered from that.

OBVIOUSLY THERE'S AN ELEMENT OF COMPOSITION IN SOUND RECORDING: SELECTION OF PARTICULAR ASPECTS OF THE SONIC LANDSCAPE, MIC PLACEMENT, EDITING, ETC. IN SOME WAYS THESE MIGHT BE SAID TO PARALLEL A PAINTERLY APPROACH TO RENDERING LANDSCAPES: WITH PERSPECTIVE, ATMOSPHERE, AND WITH SPACE-DEFINING TEXTURES. TO WHAT EXTENT DO VISUAL-SPATIAL METAPHORS ENABLE YOU IN YOUR HIGHLY SUCCESSFUL EVOCATIONS OF PLACE?

Well, I don't think that the metaphors help me much at all. They're like a distraction. But the reality is that the visual elements of a landscape in a, say, well-composed photograph, directly correspond to a well-composed perspective in an acous-

tic environment. And it's a trick that I have for myself. Because after days in the field recording, sometimes frantic, because I become rather passionate sometimes about a particular expression that a bird might make, for instance the eastern winter wren, which I just absolutely love, as it echoes through the hardwood forest. And sometimes I find that I've worked with it just so long that I can't seem to settle in on anything. And so the trick that I have is that I say, OK, this is no longer sound recording equipment. Let's pretend this is a camera. I'm just going to work with composing a photograph. And I did enjoy and I still do landscape photography, for much longer than I've done sound recording. And so then I just work with composing the visual portrait. And I don't think there's been a time I've used that for composing a sound portrait, that it hasn't worked.

But the difference is, the visual element, when you compose with that, is often not as fine-tuned as you can reach dealing with it as an acoustic element. Because, after all, you can hear things beyond the curtain that might be imposed by vegetation. So it's really a start. But a very good start.

Also, I can see how some of the terminology could easily be borrowed for the purposes of communicating. I've borrowed it already in saying "natural sound portraiture." But I am hesitant to even develop a terminology, or a method, for thinking and composing and developing what it is that you are after. We already know everything it is we need to know about nature listening, and also composing. We may not know everything we need to know yet about the technical details. But we already know everything about listening and composing. But there's a lot to forget, a lot of stuff to remove, so that we can respond quickly and intuitively, and be aware of what our feelings are. Because, after all, we're animals in a natural environment, and we will respond accurately and intelligently to the sound that we hear. And also—this is something I find fascinating when I work in sound recording—when I'm thinking about my work, I can almost feel it in my brain. And when I think about it for a long time, it even becomes like a dull headache and fatigue. And I've recognized that this is a sign that I am, like, lapsing into poor habits here. And that I need to stop thinking about my work, and just feel my work. And when I do, I know that the thoughts are occurring in my body, not my brain. And that also does not produce fatigue,

it produces inspiration. And it begins to support itself and go on. It works that way.

COULD YOU SPEAK ABOUT THE RELATION OF ABSTRACT TO NATURAL IN SOUND ENVIRONMENTS? SOME RAIN FOREST SOUNDS, FOR INSTANCE, COULD BE APPRECIATED ON THE LEVEL OF NON-REFERENTIAL SOUND ALONE.

Can you restate that for me?

PART OF THE JOY IN LISTENING TO NATURAL SOUNDS, IS IDENTIFYING THE FROG ON THE LOG IN A BOG, OR WHATEVER. BUT IT'S ALSO JUST LISTENING TO THE SOUND OF THE FROG ALONE AS AN ABSTRACT SOUND, WITHOUT A REFERENTIAL ASPECT TO IT.

Oh, the need to reference the sounds alone to the real world? Particularly when we hear it as a recorded sound, and we do not have access to the real place itself?

YES.

You know, that is interesting. The opportunity to reference a work, and even to title a work, is something that different artists have different opinions about. For instance, when you walk up to a piece of art hanging on a wall, and the title says, "Untitled Piece #." There is a sense of disappointment, right? That somehow the artist has not even left a footprint. Has not even shown their presence when obviously their presence is there. Who are they trying to fool? And yet the presence does need, I think, to be in balance with the experience. And so I do in my work usually include a title. And include some thematic presentation of the theme or the vehicle that provides continuity, just to sort of start a person. And then where they go with it is up to them.

FINALLY; LET ME ASK YOU WHAT YOUR FAVORITE RECORDINGS HAVE BEEN, WHICH YOU'VE RELEASED ON CD.

Of the recordings I've released on CD, I think each recording has at one time or another been my favorite, or it wouldn't have made it there. I think everything I've put on a CD has in the field captivated me. And held special attention, so that when I worked with it in the studio I remembered a lot

about the experience. I will answer this question with one or two selections. It's on Rolling Thunder. And to tell you the truth, I don't know what the piece is titled on the CD. The original title was exactly how I heard it, and the only way I experienced it. Which was: "An Angel Sings To God." That title didn't work. But it was clearly what I experienced there, with the eastern meadowlark singing in balance with the distant rumbling thunder. And I particularly enjoyed, on the album, the way the song develops, takes form, and that there's some improvisation that occurs there. And in the original field recording, it goes on even more. And it was unfortunate not more of the album could have been devoted to that. But when you only have sixty minutes to work with on an album there has to be some compromise. But I remember "An Angel sings To God" was a piece that humbled me. And I felt so privileged to witness it. All those years I had spent trying to do what I was doing was validated at that moment. And it certainly remains one of the most inspirational pieces I could ever listen to. And if anybody else enjoys it, then that's an added benefit. For that song alone, I would never regret any of the work that I've had to do to produce it.



Gordon Hempton's VW van

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All photography by and courtesy of Susan Manchester

A Field Recording Guide. Part Two: Selected Equipment Reviews

By Rudy Trubitt

Here's part 2 of my Field Recording Guide, originally published in Electronic Musician magazine in November, 1997. While the last installment covered techniques, this article reviews a number of pieces of equipment. I've updated my comments with the benefit of several years' experience with some of this equipment, but bear in mind that if I were writing the same story today, the list of products covered might differ somewhat. Prices shown are as of Fall 2001.

SONY TCD D8 DAT RECORDER (~\$580 STREET)

While other manufacturers have made ultra-portable, consumer DAT recorders, only Sony has done so consistently. Current models include the TCD-D8 and the more recent TCD-100 and PCM-M1 (~\$680 street). Having spent no significant time using the TCD-100 or M1 myself, I'll confine my comments to the deck I know, the D8. Note that I also use Mini-Disc on occasion, especially when ultimate portability is important. But that's a subject best left for another time.

The D8 strikes a compromise between portability, cost and the features required for our purposes. You won't get rugged connectors, a sturdy mic-pre or SCMS-free recordings, but you do get decent battery life, extreme portability, easy operation and access to the collective wares of an entire cottage-industry that has sprung up around these tiny decks.

The TCD-8 is only 5 1/4" x 3 1/2" x 1 1/2". The unit has a generous LCD display with switchable, highly readable back lighting. All analog I/O is done via Walkman-style 3.5mm mini phone connectors. Sony's mic inputs feature "plug in power," a sort of low-voltage phantom power-like scheme that provides a minuscule amount of power for electret microphones (this won't supply phantom power to pro mics). A single record level knob adjusts left and

right together, but not independently. The unit also has a switchable auto-record level function, which ignores the record level knob and sets a conservative -12 VU or lower record level for the microphone input. While I always use manual level control for critical recordings, this convenience feature lets me be more attentive to non-technical happenings, for example, when recording interviews or leaving the machine for unattended recording.

The D8 can record analog or digital signals at 44.1 as well as 32 and 48kHz. The unit also records DATs with absolute time (not to be confused with time code!). I find this a welcome feature, since my Panasonic 3700 can't display relative time.

My only serious complaint about the D8 is it's relatively wimpy mic-preamp. Sony recommends keeping your record levels around -12 on the meters (which is what its AGC "music" and "speech" auto record level modes shoot

for). Recording above that level can lead to clipping of transients and a slightly compressed overall sound. Recording through the line level inputs avoids this problem, but that's not much consolation unless you carry an outboard mic-pre into the field. This limitation is pretty widely known-



Sony's TCD-D8 DAT recorder strikes an excellent balance between features, size and ease of operation. However, looking ahead the DAT format may be in decline, with few new models being released. MiniDisc is the likely successor for the consumer portable recording marketplace, although the MD format is itself a compromise.

it's discussed at length on Internet sites covering portable DATs, including the previous model, the D7. It's too bad that Sony didn't remedy this problem in the D8. The newer TCD-100 and M1 claim improvements in this area, but I haven't tested them myself.

The D8's headphone level control is set by a pair of digital, up/down buttons. The 20 step-range invariably leaves me wishing for a volume setting *between* two adjacent steps. Give me a knob any day. At maximum level, the D8 will drive a pair of Sony V6 phones to levels adequate for most, but not all, situations. To enhance my field monitoring options, I built a passive headphone box with a volume knob and rotary switch that will allow monitoring of left or right signals in mono, as well as left/right mono, normal stereo or reversed stereo. If you're interested in making one of your own (it's an extremely easy DIY project) visit my web site at <http://www.trubitt.com>

Despite my complaints, I have definitely gotten my money's worth from my D8. I have a fool-proof solution to the problems with the unit's poor mic preamp: while connecting an external phantom power supply to the D8's mic input, I blew out a capacitor in the right channel, rendering the mic preamp useless (well, half-useless anyway). As a result, I always use an external mic preamp with my D8, and therefore, the problem is solved. Kids, don't try this at home.

SBM-1 OPTIONAL A/D CONVERTER (~\$500)

The most intriguing D8 accessory offered by Sony is the SBM-1 super bit-mapping A/D converter. Super bit-mapping is Sony's scheme for squeezing somewhat greater resolution into the 16-bit storage capacity of DAT. The unit is inexpensive as far as higher resolution converters go and sized to mate happily with the TCD D8 (it also works with some previous Sony DAT models).

The combined sound of the SBM-1 mic-pre and A/D is noticeably brighter and somewhat more open than that of the stock D8. When compared to the mic pres in my original Mackie 1202 mixer, both the D8 and SBM-1 had a plumper, perhaps slightly over-accentuated low end. While SBM-1 mic pre provides about 10 dB more gain than the D8's mic input, its noise performance appears to be roughly equivalent.

The SBM-1 includes dual 1/4" mic jacks and RCA phono line inputs are provided, as well as the 3.5mm stereo mini connectors for mic in and phones out. Independent left and right record level adjustments are possible, and a 20 dB mic pad is provided (the auto-record level option of the D8 is omitted). A pair of bright LEDs show clipping, you'll use the level meters on the D8 for setting nominal levels.

Connection between the SBM-1 and D8 recorder is via Sony's proprietary mini 7-pin cable. Adapters are required if you want to do any digital I/O between the SBM-1 or D8 and any other DAT recorders or a hard-disk editing system. Sony offers separate optical and coax adapters for this purpose but the coax product requires a wall-wart power supply. For field use, the "Oade cable" from Hi-Fi Sales and Service is popular among the live-concert taping crowd, as it provides coax I/O that can be daisy-chained from machine to machine during recording. If you need to get from an optical digital connector to a coax S/PDIF one, pick up a Fostex COP-1 (\$95) optical to coax converter, although this also requires a wall-wart to run.

The SBM-1 comes with a sleek leather case that holds it and the D8 side-by-side. While I appreciate the thought, I found the case unusable. For example, it's difficult to supply external battery power to the encased units, the D8 headphone level controls become inaccessible and you can't change tapes without pulling everything apart (for my solution to this problem, see the "Suiting Up" sidebar).

The SBM-1 does make a noticeable improvement to the sound of a stock D8. However, I wouldn't expect miracles from the pseudo-20 bit Super Bit-Mapping process, as these types of encoding schemes tend to lose their effectiveness if the audio is subsequently processed by level or EQ changes, which is very likely during post-production.

I have found the SBM-1 device useful, but there are other options: I'm very pleased with my



The Denecke AD-20 is a combined microphone preamplifier and analog-to-digital converter offering XLR inputs (no phantom power) and coaxial and optical digital outputs. A proprietary cable is required to use the AD-20 with the Sony D8.

Denecke AD-20 Microphone Preamp and A/D converter. This sturdy box features XLR inputs (but no phantom power) and runs off a 9V battery. At \$325 list, this is probably a better value than the SBM-1 and certainly more rugged.

As far as mic preamps without A/D converters are concerned, there are many options. Sound Devices (www.sounddevices.com) have a good reputation, and are comparable in price to the SBM-1. I myself own and love my Grace Design Lunatec V2 mic



While at the upper-end in terms of price, the Grace Design Lunatec V2 is an excellent microphone preamplifier. It provides phantom power, XLR and RCA analog outputs, stepped gain controls with variable trim and switchable high-pass filters and M/S decoding.

preamp (www.gracedesign.com). My best field recordings have used the Grace pre-amp paired with my Schoeps microphones.

PORTABLE POWER

Compared to larger field DAT machines that often get less than an hour per internal rechargeable battery pack, the Sony TCD-D8 does pretty well, running for two-and-a-half to four hours on four disposable AA nicads. The SBM-1 goes through its own 4 AAs in about two hours. While this is enough time for a lot of recording, I'm not crazy about the expense and waste of all those AA cells.

Fortunately, several companies make portable battery packs suitable for the D8 and SBM-1. One such vendor is Eco-Charge (www.eco-charge.com), who makes different capacity sealed lead-acid battery packs for a number of portable recorders. Their smallest system, the Sigma (~\$150), is suitable for running a TCD-D7 or D8 for 15 hours. The slightly higher capacity Sigma Plus (~\$180) powers both the deck and the SBM-1 for up to 12 hours on a

single charge. I tested the Sigma-Plus system and it worked very well. Connections to the deck and A/D are via right-angle mini DC connectors. Connection between battery and the deck or charger is made with one of the new Switchcraft mini-XLR connectors for solid, positive contact. The battery, only slightly larger than the deck itself, is juiced by a hefty "smart charger" that looks like a giant wall-wart. The charger blinks an LED to let you know charging status; Eco-Charge batteries can be left connected indefinitely without damage.

Unfortunately, the D8's battery charge indicators are disengaged when connecting an external DC source, so you have no way of judging your remaining power reserves, other than keeping track of how many tapes you've recorded. If you aren't paying attention, the D8 will flash "battery" at you, but by then it's too late-recording will have already stopped. Fortunately, the SBM-1's charge-level LED indicators still work with an external pack connected. Overall, Eco-Charges products appear to be solidly constructed and thoughtfully designed. I've been using my original batteries for about four years and never had a problem.

What about power for a device that requires 120VAC, like a small mixer? If you will be recording near your car, you can use an AC inverter that converts 12VDC from an automotive or marine electrical system to 120VAC. Generic inverters have a reputation for making "dirty" AC i.e. more of a triangle wave than a pure AC sine wave. I've gotten acceptable results using a simple, \$100 Philmore DC220 inverter. Some gear tends to buzz a little bit, paying attention to keeping audio and power cables separated helps. Just be sure and test such a device at home before you need to rely on it in the field!

Another option, designed specifically for portable audio systems, is Galaxy Audio's "Far Outlet" (~\$350, <http://www.galaxyaudio.com>). This device uses a standard marine battery that can be charged from a car cigarette lighter or 120 VAC wall outlet, and puts out regulation AC wall-power for equipment like small mixing boards and other non-battery gear.

PORTABLE PHANTOM POWER

Perhaps you already own a couple of high quality condenser mics and want to use them for outdoor



The Denecke Dcode PS-1 provides phantom power to a condenser microphone from a single 9V battery.

sound gathering. But what to do about phantom power? The Denecke Dcode PS-1 (~\$120) is an excellent and compact solution to this problem, providing phantom power from a single 9V battery. From a construction standpoint, this was the most simple, solid and attractive piece of gear I tested for this story. Slightly bigger than a pack of cigarettes, the PS-1 is made from a blue anodized aluminum enclosure with a belt clip, male and female XLRs and an internal switchable -15 pad. 9V battery access doesn't require removing any screws or hinged doors and the few questions one might have about such a straight-forward unit are answered by a decal right on the box. Highly recommended, with one very serious warning: The Sony mic inputs (on both the D8 or SBM-1) can be blown-up when connecting the Denecke (and probably other manufacturer's phantom supplies). This happens because the Sony inputs see the phantom power too, and they have very low-voltage rated capacitors in their signal path. I believe I have blown two of these capacitors on different occasions, which renders that particular channel useless. Consequently, I DO NOT recommend connecting phantom-power boxes to the mic inputs of any consumer gear unless you are sure the device can handle phantom power voltages without frying.

MICROPHONES

AUDIOTECHNICA AT825 (~\$325 STREET)

For point-and-shoot simplicity, the AT825 took the cake. With only a low-cut switch to consider, this XY-stereo mic was the least complicated to work with. Although hardly as invisible as the Sonic Studio mics (see below), it is considerably smaller

than the VP-88 (again, see below). The AT825 comes with a foam windscreen and adequate-quality 10-foot cable (5-pin XLR to dual 3-pin XLR). A zipper case and mic stand clip are also provided. Unfortunately, the mic doesn't fit in its own case when the windscreen is attached. Power is supplied by a single AA battery or phantom power may be used. I appreciate the fact that battery power is disconnected when the mic's cable is unplugged, rather than forcing me to remember to turn off a switch, as is the case with the Shure VP-88.

Overall, this mic is very convenient to use and a good value. It's compact size and directional pickup pattern work predictably in a variety of situations. However, I find that cardioid mics (including this one) add a slightly "pinched" quality to ambiances. Nonetheless, if you don't have the budget for a more expensive mic, the AT 825 will serve you well with good detail and a "present" stereo image.

SHURE VP-88 (~ \$800 STREET)

Shure's VP-88 M/S stereo microphone provides great flexibility in the field. It can be powered off an



The Shure VP-88 isn't a small microphone, but it's stuffed with features, including a built-in M/S decoder with three stereo width settings as well as a decoder bypass. Also included is a high-pass filter. The mic can run off an internal battery or external phantom power.

internal 6V battery or 48V phantom, has a low cut switch and offers four different stereo modes. Three of these modes vary the balance between the mid and side signals, allowing low, medium and high-width stereo recordings. The fourth option simply switches out the M/S circuitry and provides you

with mid and side signals independently on the left and right channels. If you choose this option, you'll have to decode these signals during post-production, but you gain flexibility in return. M/S decoding can be done in software or hardware, email me (rudy@trubitt.com) if you have questions about the process.

I can also recommend the VP-88 for music recording. It has a nice, bright sound with more open transient response than the AT825. A lot of studio engineers have been using the VP-88 as a drum overhead and I can see why-it sounds great with a little help from a kick mic.

While I appreciate the number of options offered by the VP-88 (internal/phantom, low cut on/off and the four stereo modes), feature selection is determined by just two, four-position switches. Although this does not compromise the functionality of the mic, its somewhat cryptic labeling takes an extra moment to sort out. It's also easy to forget to turn battery power off, which drains the little 6V battery flat after several days-a \$5 mistake. I wish disconnecting the mic cable automatically turned off the battery. Speaking of cables, the VP-88 is supplied with a high-quality three foot "Y" adapter that goes from 5-pin XLR to left and right 3-pin XLRs.

My only other concern is the size of this mic. At 11.5", it's nearly twice the size of an SM-57 and like the AT825, the VP-88 won't fit comfortably into its zipper case with it's windscreen attached.

SONIC STUDIOS DSM-6S STEREO MICS (\$450)

If ambient soundscapes are what you're looking for, I recommend the Sonic Studios DSM mics. Their omni-directional pickup pattern and head-mounting result in very natural-sounding recordings. And, because they're nearly invisible, I can wear them in crowds without people reacting to the sight of a microphone.

For best performance, the DSM mics require more power than the stock Sony mic "plug in power" can provide. Sonic Studios can mod your Sony deck to increase the power available at the mic input for \$75. Without the mod, the mics will still work, but for best sound, one in-line AA battery provides the required juice for peak performance. I tested the mics with the external battery, but I'd definitely consider having the modification done to your deck

instead. Reducing the number of wires is really important and the battery pack is just one more thing you'll need to find a place for.

While I am quite impressed by the Sonic Studio Mics' sound, I sometimes found them a little awkward to use. For instance, any head-motion will translate to noticeable shifts in the stereo image, so you need to keep still while recording. Also, taking them on and off is a little time consuming, although this is significant only on a session where you expect to be changing mics. The company offers a reasonably effective headband-mounted windscreen which also provides a way to get the mics on and off your head more quickly. However, rough handling can shake the capsules loose from their cages, but the little wind socks hide the fact. Your ears won't lie, however-if the mics slip off their mounts in the windscreen, the sound gets pretty screwy.

Finally, be careful with your headphone levels when using head-worn mics. Once while wearing a pair of "ear bud," Walkman-style phones, I kept hearing a weird, phasey problem. I couldn't figure out why until I turned the phones up so far that they started to feedback. Ouch! Sound from the 'phones was leaking back into the mics, just an inch or two away from my ears. This was causing a feedback path, resulting in phase-cancellation and eventually, feedback.

If you're interested in this style of microphone, you might also want to check out three other suppliers of head-worn mics: Core Sound (<http://www.core-sound.com/>), Josephson Engineering (www.josephson.com) and German company Soundman's OKM-series microphones (<http://www.soundman.de>). I own a set of the Soundman OKM mics and my initial experiences with the product have been very good.

SHHH! RECORDING QUIET SOUNDS

Recording natural sounds often means working with very quiet sources. I tested the ability of all three mics (Shure, AT and Sonic Studios) to record a very quiet sound-the ticking of a pocket watch, recorded through the stock mic preamp of the D8 at maximum gain. All three mics were pushing their luck on this tiny sound, with the Sonic Studios DSM-1 being the noisiest. As a control, I recorded the same watch with one of my Schoeps mics, run-

ning through a Denecke PS-1 phantom power box, into the stock D8 mic pre (warning-I later learned that using a phantom box can cause permanent damage to the Sony mic inputs!). This was decidedly the quietest of the bunch. However, usable results were only achieved when running the Schopes through my Mackie 1202 and then into the line input of the D8. A quality external mic-pre-amp should provide similar results.

CONNECTORS

Connectors are the biggest problem when working with a consumer-style deck like the D8 or Mini-Disc recorders. While compact, 3.5mm connectors are delicate and require adapters to be interfaced to most professional gear. Right-angle plugs are a very good idea. Unfortunately, I have been completely unsuccessful in finding right-angle 3.5 mm plugs for DIY adapters. The best I was able to come up with was cutting the molded right-angle mini plug off an old set of headphones. I did find a satisfying compact right-angle 1/4" phone plug from George L's Musical Products, who manufactures a line of solderless connectors and cable. These work by simply cutting a length of George L's cable, jamming it into the plug and tightening a set screw. I used a pair of right angle plugs to build a dual-XLR to 1/4" cable for interfacing mics to the SBM-1 (wire pins 1 and 3 to the sleeve, pin 2 to the tip). The connections seem secure, and hey-they're field repairable with just a wire cutter.

A number of companies make custom adapters to get in and out of stereo mini jacks. I tested a set of "Pig-Ends," (~\$25) made by Tuolume Films. This nicely constructed adapter and thin, flexible cable gets you from dual-XLR to 3.5mm straight plug. They are available in 12", 36" and 72" lengths. Sonic Studios (who's DSM mics are reviewed elsewhere in this article) molds their own right-angle 3.5mm plugs. While I didn't test the XLR adapters they offer, I was impressed by the right-angle connectors on their mics. I'd certainly consider one of Sonic's adapters if a right-angle connection is important for your rig.

SUITING UP

Since I wasn't happy with the DAT case supplied by Sony, I paid a visit to a REI, a large outdoor-equipment supplier. I was looking for a fanny/

waist-pack that would provide protection for the gear while keeping critical controls accessible and my hands free. Several camera-lens-and-accessory bags looked promising, but these tended to be too deep. After much fretting, I settled upon the "Padded Excursion Bag" by Eagle Creek (800-874-9925). This was big enough to hold the D8 SBM-1 and large Eco-Charge battery in a position that allowed complete access to metering and transport controls.

Then it was off to the accessory department for some clips for cables and other miscellany. Metal mountaineering clips are attractive, but with live microphones in-hand, the quieter your gear is while moving, the better. I chose plastic clips instead. Another tip for cheap-skates such as myself: Camera stores sometimes have a big box of used, empty zoom lens cases behind the counter. These can make excellent mic containers.

Finally, I found a musical instrument strap that works with the Eagle Creek (and probably other) big waist-packs. It's The Slider Sax Harness (\$39.95) from Slide Straps (<http://www.slider-straps.com/>). The strap crosses over both shoulders, and ends in a plastic clip over your belly. I attach said clip to a strap on the waist-pack, and voila! The weight of the waist-pack is now shared between both hips and shoulders, providing better stability and greater comfort. No more sagging fanny!

As you can see, there's a lot of gear out there (this review only scratches the surface!) Just keep two things in mind: Think about your system as a collection of modules. When you decide to spend a little money, imagine how a new purchase will fit in with the other equipment you already own. For natural sound recording, it's especially important to know which parts of your system are the noisiest, as you may want to spend money there first.

My second, and final point is this: don't let your equipment (or perceived lack thereof) stand in your way. Get out and use the gear you have. If a distant bird exceeds your microphone's reach, find the sounds around you. The rustle of leaves, the rush of a tiny stream or the chirp of a nearby cricket. The world is full of sounds, so get out there and record them!

All photos by and courtesy of the author

To Be(gin Playback) or Not to Be(gin Playback), That Is The Question!

By Bill Gilbert, Ph.D.

Whether 'tis nobler in the mind to conform to the wishes of outraged birders, and to cease using recorded playback, or to take arms against these purists, and by blatantly using playback, silence them.

As an avid birder in the eastern United States, your goal each spring is to see all of over thirty wood warbler species that regularly pass through your state. Thus one morning late in May you stand by the old canal bed, binoculars and tape recorder in hand, trying to sight the uncommon and secretive Connecticut Warbler, your last unchecked species. The long-abandoned canal, filled with burdock, poison hemlock, poison ivy, blackberries, nettle,



Bill Gilbert adjusts volume of recorded playback setup designed to attract a warbler into his mist net. You can't see the net? Neither can the warblers. That's why they get caught. Attracting territorial male birds into a mist net for banding and measuring is just one way in which playback is used in scientific studies.

science. Perhaps because I am a birder, a recordist, and a scientist all in one, Natur sounds Editor

and every other brand of scratching and urticating plant known to man, is a perfect haunt for your elusive prey. Impatiently you roll a tape of the Connecticut's song. No response! For over an hour you work the canal's edge. No response! Finally, from deep in the dark tangles, a response! The bird is shy, however, and comes no closer. So you plunge into the brush. Thorns tear your ankles and nettles numb your hands, but you press on. Now, just beyond a huge black willow, your quarry answers. Peering around the trunk you finally spot it: another birder with a tape recorder!

This vignette, showing how birders can fool each other, highlights just one possible problem of using recorded playback in birding, nature recording, and

Sharon Perry asked me to write an authoritative article on this controversial issue. Little did she realize that I didn't know beans about the subject.

But I am resourceful! I could draw on two decades of using playback in the field for bird banding and research, I knew the ornithological literature, and I knew how to use the library I quickly went there to find an authoritative article. In Current Contents, under keywords "playback" and "recorded playback," I found title after title on neat ways scientists use playback to solve taxonomic, acoustic, and behavioral problems, mostly with birds. Unfortunately, there was nothing about playback's dark underbelly. I then turned to my personal memory of the bird song and behavior literature dating back several decades. Unfortunately, my data banks came up empty.

Back to square one and clueless, I contacted Sharon. I told her I had lots of great information on playback, but did she possibly know of any additional sources (just to cover my bases, of course). Sharon suggested I check out the Nature Recordists' Website. I did this, and downloaded relevant material from a discussion thread on the ethics of using recorded playback. I was off and running (or at least I thought).

Reviewing the interchanges of the playback ethics thread, I was struck by the thoughtfulness and sophistication of the discussion. Seven participants, including Doug Von Gausig (coordinator of the Website) and Bernie Krause came down on the side of using little if any playback for recreational/commercial purposes (e.g., attracting birds for viewing or stimulating them to sing for recordings). Four participants, including Dave Lauten from Oregon and J. R. Fletcher (a former birding guide in the tropics) saw no harm with moderate use of recreational/commercial playback. Interestingly, participants on both sides of the issue condoned

moderate playback use for scientific/management purposes, such as for separating "sibling" species of birds, documenting range extensions, or broadcasting distress calls to deter agricultural pests.

So the controversy lay with recreational/commercial use, and democracy would declare the "purists" (those against playback use) the winners. But this article isn't about democracy, so let's review the arguments. Those against recreational playback said it greatly disturbs birds, makes their behavior and vocalizations abnormal, and can harm their nesting and viability. Syd Curtis, an eloquent Aussie, admitted to having caused a rare Albert's Lyrebird "extreme distress" many years ago by bombarding it with its own song. Doug Von Gausig stated that playback elicits "---fear and defensive reactions, and other uncommon, unnatural responses" and that "--- we (don't) have the right to inject these influences ---." Jim Morgan cited two Western Kingbirds that "--- became extremely agitated --- and then promptly left the area (after hearing playback)." Finally, Marty Michener expressed his views with "I have watched poor birders, repeatedly playing the same cuts to birds in the field, never even noticing the male (bird) has responded, but they are too yang-adrenaline-testosterone poisoned to even see." Obviously, playback raises the hackles on some people's necks.

On the other side of the aisle, Dave Lauten argued that response to playback is "quite natural." He also suggested that man-made problems, from habitat loss to oil spills, put much more pressure on birds than does occasional playback. J. R. Fletcher (the former bird guide in Ecuador) said he saw no adverse effects among tropical birds from using recorded playback over many years. J. R. tested his thesis of no lasting effects by subjecting territorial males of seven temperate-zone species to playback. He found birds attracted to temporary playback usually took less than a minute to return to normal behavior. The extreme was a Hutton Vireo which gave an altered call for 30 minutes. On the other hand, individuals of five other species gave no response at all to playback.

So what is the answer? Is playback harmful or not? Dave Lauten, T. Stephenson, and Alvin Cearley asked if anyone could cite an actual published study on the subject. J. R. Fletcher said he knew of none, Jim Morgan said "I'm sure they can be found," and Doug Von Gausig suggested that such

studies might be located where playback had been used to control pests (such as driving Starlings from airports). Aside from these inconclusive responses, however, the silence on actual studies was deafening.

Now I had done a literature search, consulted my memory banks, and assimilated the opinions of some of the best and brightest in the recording world, and to a great extent I still was back at square one. My last hope to make better sense of the issue lay in reviewing my own experiences as a researcher, bander, recordist, and watcher of birds.

Initially let me say there are circumstances where I personally believe recreational/commercial playback should not be used. For example, recorded playback is banned on the breeding grounds of the endangered Kirtland's Warbler in Michigan, and I would concur for three reasons. The ban might

preclude the possibility that a birder (they flock to the area for guided tours) might place the Kirtland's on his or her life list based on hearing some other birder's Sony. The ban also might shield Fish and Wildlife Service

bureaucrats from possible criticism that they were endangering Kirtland's Warbler reproduction or viability. Finally, since the Kirtland's is endangered, if there is any possibility that lots of tourists with tape recorders could disrupt normal breeding, then we should err on the side of caution.

I also understand that playback of a certain owl species (possibly the Whiskered Screech) is banned from a heavily touristed area of southern Arizona. Again, I would concur with what possibly is more of a courtesy to the birder than to the bird. In general (as my opening vignette might suggest) we should practice utmost courtesy in using playback where other birders abound (minimally, yell "fore" before pressing the button).



Recorded playback setup using a Sony TCD-D7 DAT recorder and a high quality field-portable speaker (Maxi Mouse, Lectronsonics Corp., Rio Rancho, NM). Assuming one has a good playback machine, effectiveness of playback can vary with quality of playback recording and speaker.

Courtesy to birders is one thing, but what about possible effects of playback on the birds themselves? We have established that opinions on this are divided, and that there likely are few if any published studies on the matter. The fact that no such studies can be readily found might give us a clue, however. Scientists, like investors, seek the most return for their investment, and thus choose research projects that prior knowledge suggests will give good results. For example, few scientists would search for the Sasquatch. If DNA testing on a recovered hair sample indicated an unknown species of ape, however, scientists likely would take up the search. Perhaps few if any scientists have tested long-term playback effects on birds because they have little a-priori evidence that such effects exist.

During many years of field research with Wilson's and Orange-crowned Warblers I have seen no evidence for ill effects from playback. The birds responding to playback mainly are males (a fact also pointed out in the ethics thread), and those males tend to respond most strongly before mating (and thus before nesting begins). Therefore, even if playback did cause adverse behavior in a male before mating, it likely would minimally affect the actual nesting process. Also, as Walt Knapp of the ethics thread pointed out, even if a bird does respond strongly to playback, we cannot assume that the response necessarily is detrimental. Speaking anthropomorphically, I agree with Walt that a strongly responsive male may just be getting practice and confidence in driving away intruders. I back his view with observations. My older male warblers tend to hang back, responding to playback only with song, if at all. It seems they have been through it all before, and can deal with any rival. New territorial birds, however, often show strong playback response. Until they have a few encounters and victories under their belts, they tend to appear frantic (which tends to make them great subjects for mist netting). So experience in dealing with intruder song (even playback) may be a good thing for a male bird.



A very compact, lightweight, good-quality playback setup can be constructed from a Sony TCD-D7 or TCD-D8 DAT recorder and a small speaker, both contained within a small padded camera case. Birds can better tell that recorded playback is "fake" if one portion of playback setup is not of top quality. For example, Realistic (Radio Shack) speaker on left has tended to be less effective in attracting warblers than Sony speaker on right.

Another observation that has molded my opinion on playback is that rival male birds tend to have a hierarchy of response toward each other. Initial response tends to be with song. If song does not settle a dispute (e.g., the location of a territorial border), then the conflicting males often stop singing and confront each other with chip notes and aggressive displays (conflicting Wilson's Warbler males often circle each other while flipping their wings). If things get real serious, males can end up in "claw-to-claw" combat, and I occasionally see two "locked" males flutter to the ground and continue pecking at each other even while lying in the duff. The point here is that, while inexperienced males may get their adrenalin up in responding aggressively to song, established males seem to regard song as just a first stage of aggression, and something they easily can deal with.

Finally, the thing that most leads me to believe that hearing temporary playback likely has little lasting effect on birds is that, in addition to being a recordist, I also am a bird bander. Banding is an essential operation for many, perhaps most, avian field studies; only through color banding can one tell individual birds apart. Banding often means capturing one's subjects in a mist net. I hope I do not offend those acutely attuned to the feelings of birds by revealing the details of an average netting and banding operation. Elliot McClure, the Dean of American bird banding, expressed it bluntly in writing: "From the standpoint of the

bird, the net is an abominable creation. Birds do not like to be netted."* Imagine being snagged from mid air by a giant cobweb, having a massive predator descend on you, capture you, carry you off in a bag, then capture you again and tweak your every extremity before finally letting you go. If the pecking on one's hand doesn't suggest the bird is unhappy, then the struggling in the net, the bag, and in the hand should. This struggling sometimes leads to exhaustion, and good banders are trained to see its first signs. When a bird's eyelids begin to flutter, measurements cease and the bird is held softly in the hand as it "falls asleep." Within about

15 minutes the bird recovers, looks around, and flies away. Although likely confused, it is unharmed.

Even though the process of netting and banding is stressful for a bird, only once have I seen a lasting behavioral effect. A female orange crown I netted while building her nest subsequently stopped building and abandoned her mate (never since have I netted a nest-building female). Otherwise, I have netted and banded hundreds of Orange-crowned and Wilson's Warblers and not one male has abandoned its territory, and not one female has abandoned her eggs, following the process. Males resume singing, sometimes within the hour but certainly by the next day, and females always return to their eggs within the hour. I also have seen no evidence that breeding success (e.g., hatching rate, fledging rate) is harmed in any way.

It is possible that the behavioral responses of some bird species are different from those of my warblers. However, I know of no official restrictions on banding any species based on known adverse behavioral responses (such as likely territorial abandonment). My master banding permit allows for capture of "all species except waterfowl, eagles or endangered/threatened species."

The reason I have gone on and on about netting and banding is to emphasize how temporarily traumatic the experience is for a bird. However, if birds typically can survive netting and banding with no continuing effects, then hearing playback may be way down on a list of things that could cause a bird lasting problems. I believe other field ornithologists who mist net and band would think similarly. This familiarity with the process of netting and banding, plus a general knowledge of bird behavior, may partially explain why scientists have been reluctant to study possible adverse playback effects. To quote J. R. Fletcher from the ethics thread: "(I) firmly believe them (birds) to be resilient scrappy beings quite able to take in stride far greater upset than an occasional spurious voice followed by a brief search for an intruder that turns out not to be there."

Even though little if any research has been directed toward the supposed dark side of playback, could such studies be designed to settle the playback controversy? There would be many complicating factors, as was pointed out by Marty Michener in the ethics thread. Also, a direct test using normal playback conditions probably would not work. What

might work is to test extreme conditions of playback. One might start by issuing playback continually from dawn until dusk to territorial males of a given bird species. Control territories would receive no playback. If effects were evident (e.g., if playback males abandoned their territories or did not attract mates), then in the next series of tests one might reduce playback by 50% (perhaps one hour on and one hour off during the day). Over a series of tests one might reduce playback frequency until there was no measurable effect on the birds. One might presume playback frequencies below that level to be "safe." Of course, to conduct such a lengthy, loud experiment one might need a large private wooded estate for a study area, preferably one patrolled by bloodthirsty Dobermans so playback equipment would not be vandalized. Your local park probably would not do.

So that's the skinny on use of recorded playback, at least as I interpret it. Most concerned with this issue seem to support playback for scientific/management purposes, but not for recreational/commercial uses in heavily touristed areas (especially where there are rare target species). A fairly even split of opinion exists, however, for the general use of recreational/commercial playback, and for whether that playback might compromise target species' reproduction, survival, and behavior. Efforts to locate published studies on the topic have come up empty. This apparent paucity of controlled research might seem surprising until viewed from the perspective of scientists best situated to carry out the studies. That such scientists apparently have minimal enthusiasm for the studies might suggest minimal concern for the "problem."

This discourse likely will not settle the recorded playback debate. I really have only entered my opinion into the mix, and given my reasons. Even counting my vote in favor of moderate recreational/commercial playback use would still leave the tally at seven to five in favor of the "purists." Only after someone does a definitive study might the debate reasonably end. In case you want to apply for a grant to study this thing, don't forget to include funding for the Doberman kibble.

*McClure, Elliott. 1988. *Bird Banding*. Pacific Grove, CA: The Boxwood Press (p. 189).

Photography courtesy of the author.

Seasonal Callendar of Recording Opportunities in California

by Janet Doell

The recording opportunities suggested here are largely located in the San Francisco Bay Area, and are chosen for their accessibility and the best conditions for natural quiet. These locations are given as examples of where members have recorded in the past and represent the first step in developing a data base for recording opportunities. Additions and corrections are welcome.

A second invaluable source of information about possible recording locations has been the book Seasonal Guide to the Natural Year/Northern California, by Bill McMillon. Good directions to many of the locations cited below are given in the McMillon book as well. For further detailed information about where the species you want to record is located within one of the larger preserves, check with the Visitor Center or Ranger Station at the facility.

The Nature Sound Society urges readers to share their knowledge about where species can be recorded in California by sending such information to recording sites@naturesounds.org.

For each month the Species or Ambience for each listing is given first in SMALL CAPS FONT followed by the location description in normal type.

JANUARY

BREEDING GREAT HORNED OWL

At all lower elevations including the foothills.

BREEDING RED-SHOULDERED HAWKS

Prairie Creek Redwoods SP

ELEPHANT SEALS ARRIVING

San Simeon and Año Nuevo (see February).

MIGRATING GRAY WHALES

They are closer to shore on the way south at this time of year than when returning in March. Good viewing and possible recording of spouts and hydrophone recordings all along the coast from Fort Bragg to Big Sur.

PACIFIC TREE FROGS (PACIFIC CHORUS FROGS)

Many locations, i.e. East Bay Regional Parks District.

WINTERING BALD EAGLES

They roost in Bear Valley NWR outside Worden, OR, and fly to Tule Lake and Lower Klamath NWR and in Cache Creek Wilderness Study Area in Lake County to feed. They congregate at Wilson Valley about six miles into the study area in Lake County.

WINTERING BIRDS I.E. SNOW GEESE, CANADA GEESE, WHITE-FRONTED GEESE, TUNDRA SWANS, DABBLING DUCKS, SANDHILL CRANES

Central Valley locations, i.e. Grey Lodge SWA, San Joaquin Wildlife Refuge, Sacramento Valley Wildlife Refuges.

WINTERING SHORE BIRDS

Elkhorn Slough National Estuarine reserve, Santa Cruz County

FEBRUARY

BREEDING GREAT HORNED OWL

At all lower elevations including the foothills.



BREEDING SPOTTED OWL



Tomales Bay SP

DAWN CHORUS OF RESIDENTIAL BIRDS: ROBINS, MOURNING DOVES, HOUSE FINCHES, ETC.

Many locations.

ELEPHANT SEALS, YOUNG ABOUT TO BE WEANED

San Simeon is the most accessible place, day or night. Also at Año Nuevo State Reserve (ranger led trips only.)

PACIFIC TREE FROGS (PACIFIC CHORUS FROGS)

Golden Gate National Recreation Area.

SAGE GROUSE

Honey Lake near Lassen.

SHORE BIRDS

Elkhorn Slough National Estuarine Reserve, Santa Cruz County.

SMALL STREAMS BECOMING ROARING RIVERS AFTER MOST OF THE WINTER RAINS HAVE FALLEN

Many locations.

WATERFALLS

In hidden canyons of the Coast Range, i.e. Berry Creek Falls in Big Basin State Park-a sixty foot drop; Cataract Falls in Mt. Tamalpais SP-a series of small falls; Alamere Falls in Pt. Reyes National Seashore-drop over cliffs.

MARCH

AMBIENCE RECORDING: ACORN WOODPECKERS, ELLOW BILLED MAGPIES, WESTERN MEADOW-LARK

Sunol Regional Park and Wilderness.

COMMON MERGANSER

Alameda Creek.

GOLDEN EAGLE

In upper reaches of Sunol RP&W.

AMBIENCE RECORDING: HUMMINGBIRDS, CALIFORNIA QUAIL, CALIFORNIA GROUND SQUIRREL

Hastings Natural History Reservation of the U.C. Reserve System, Carmel Valley.



Hastings Reservation, Carmel Valley

BEES SWARMING. TIME NOT PREDICTABLE

Check with bee keepers.

BREEDING PACIFIC TREEFROGS (PACIFIC CHORUS FROGS).

Many locations.

BREEDING RESIDENTS: TOWHEES, ROBINS MALE TERRITORIAL SONGS

Everywhere.

BREEDING SNOWY EGRETS, GREAT EGRETS, GREAT BLUE HERON

Audubon Canyon Ranch.

BULLFROGS—LATER THAN TREE FROGS

Sunol Regional Park and Wilderness, Jasper Ridge

SEASONAL RECORDING CALENDAR

Biological Preserve, Stanford University)



Searsville lake, Jasper Ridge Biological Preserve

MOURNING DOVES STARTING COURTSHIP

Many locations.

WILD TURKEYS MALE COURTSHIP DISPLAY

Lake Sonoma (ask at Visitors' Center about where to see turkeys). Lake Berryessa in Napa County has fewer trails and fewer people. Lake Mendocino north of Ukiah

WINTERING BIRDS, I.E. CANADA GEESE, ALSO SPRING COURTSHIP DISPLAYS OF DUCKS, EGRETS, AND HERONS

Gray Lodge SWA just north of Sutter Buttes.

APRIL

AMBIENCE RECORDINGS

Sunol Regional Park and Wilderness. Hastings Natural History Reservation.

BEE SWARMING

Check with bee keepers.

BREEDING WESTERN GREBE

Lower Klamath Basin NWR.

BREEDING WOODPECKERS

Tomales Bay SP at Heart's Desire Beach.

BULL FROGS— LATER THAN TREE FROGS

Sunol Regional Wilderness, Jasper Ridge Biological Preserve (Stanford University).

DAWN CHORUS OF RESIDENT BIRDS (HERMIT THRUSHES BRIEFLY)

Many quiet locations, e.g. East Bay Regional Park District.

DAWN CHORUS

Prairie Creek Redwoods SP.

MALE SONGBIRDS CONTINUE TO SING THROUGHOUT THE DAY.

Following dawn chorus (see above).

HAWKS

Unpredictable.

HERMIT THRUSHES

Shingle Mill Preserve, San Mateo Co.*

NESTING GREAT EGRETS

Elkhorn Slough NERR.

NESTING HERONS AND GREAT EGRETS. BIRDS CHATTER AS THEY RETURN TO THE NESTS, YOUNG BIRDS SQUAWK

Audubon Canyon Ranch, heron rookery on Indian Island in Humboldt Bay NWR out of Eureka.

NESTING OSPREYS, ALARM AND TERRITORIAL CALLS

Along the coast, e.g. Tomales Bay SP.

SANDHILL CRANES, CACKLING GEESE, BALD EAGLES, SAGE GROUSE (A CACOPHONY OF SOUND)

Ash Creek SWA near Mt. Shasta.

MAY

BEES SWARMING

Check with bee keepers.

DAWN CHORUS RECORDINGS

Prairie Creek Redwoods SP, Sunol Regional Park and Wilderness, Hastings Natural History Reservation, University of California).

DAWN CHORUS OF RESIDENT BIRDS RETURNED FROM MIGRATION

Many locations. e.g. East Bay Regional Park District.

GREAT EGRETS, SNOWY EGRETS AND GREAT BLUE HERONS

Audubon Canyon Ranch.

GREAT EGRETS, SNOWY EGRETS AND GREAT BLUE HERONS

Audubon Canyon Ranch.

HAWKS, RED-TAILED AND RED-SHOULDERED, ESTABLISHING TERRITORY

Many locations, e.g. Sacramento Valley Wildlife Refuges, Hastings Natural History Reservation (U. of California).

WESTERN GREBE AND SAGE GROUSE COURTSHIP DANCES

Klamath Basin NWR complex, Lava Beds National Monument (south of Tule Lake) for Sage Grouse courtship. Both Sage Grouse and Western Grebe at Modoc NWR (out of Alturas). Also Oak Creek Wildlife Area for Grouse, Lake Earl Wildlife Area out of Crescent City for Grebes.

JUNE



ACOUSTIC INSECTS, I.E., CICADAS, CRICKETS (NOCTURNAL), KATYDIDS, GRASSHOPPERS

Many locations including Sierra Nevada foothills.

CALIFORNIA GULLS AND WILSON'S PHALAROPES

Mono Lake.

CALIFORNIA SEA LIONS-INCREASED ACTIVITY IN JUNE AND JULY



Mono Lake, CA

Pier 39, San Francisco, dawn or at night to avoid background noise. Monterey Pier, Pt. Lobos.

DAWN CHORUS/ AMBIENCE AND INDIVIDUAL BIRD SONG

Yuba Pass.

DAWN CHORUS AND INDIVIDUAL BIRD SONG OF RETURNING RESIDENT MIGRATING BIRDS.

Many locations. See April.

GEESE

Lake Merritt (City of Oakland).

NESTING GREAT EGRETS AND OTHER SHORE-BIRDS

Elkhorn Slough NERR.

NESTING PELAGIC BIRDS

Castle Rock off Pt. St. George in Crescent City (boat available), Farallon Islands.

SEASONAL RECORDING CALENDAR

OWLS, INSECTS, FROGS (NOCTURNAL)

Many locations.

TREE CRICKETS

Briones Regional Park near Lafayette.

TUFTED PUFFINS, CORMORANTS, COMMON-MURRES, PIGEON GUILLEMOTS, YELLOW-BILLED CUCKOOS

Trinidad State Beach, below Pt Reyes Lighthouse, Woodson Bridge SRA northwest of Chico, Colusa/Sacramento SRA near Colusa, Butte Slough SW at the foot of Sutter Buttes.

JULY

BEAVERS-HOW ABOUT SLAPPING BEAVER TAILS?

Plumas/Eureka SP north of Lake Tahoe, Lake Earl SWA out of Crescent City.

CANADA GEESE

Lake Merritt.

HUMMINGBIRDS

Throughout the High Sierra in midsummer, but more likely to hear them around large meadows where summer blossoms are at their peak. Field campus of San Francisco State U. is a bird mecca. Donner Memorial SP is also good for hummingbirds, as is D.L.Bliss/Emerald Bay SP.

INSECTS, OWLS, FROGS (NOCTURNAL)

Many locations (see June).

NESTING GREAT EGRETS

Audubon Canyon Ranch.

SHORE BIRDS

Elkhorn Slough NERR, Tomales Bay, Drake's Bay.

TREE CRICKETS

Briones Point.

AUGUST

CANADA GEESE

Lake Merritt.

INSECTS

Briones Point.

OWLS, INSECTS, FROGS (NOCTURNAL)

Many locations.

MIGRATING PINTAILS

Klamath NWR, Tule Lake NWR, Sacramento NWR.

SHORE BIRDS

Elkhorn Slough, Tomales Bay, Drake's Bay



Drake's Bay, Point Reyes Peninsula

WARBLERS

American River Parkway, Sacramento.

SEPTEMBER/OCTOBER

BAND-TAILED PIGEONS FEEDING ON MADRONE BERRIES

Shingle Mill Preserve.*

WESTERN GRAY SQUIRRELS CHUCK CHUCKING
AS THEY ESTABLISH TERRITORY

In tall pines in the Sierras.

MIGRATING PASSERINES-WARBLEDERS AND
VAGRANTS

Pt. Reyes Peninsula.

OWLS, INSECTS, FROGS (NOCTURNAL)

Many locations.

RUTTING TULE ELK AND MULE DEER

Tomales Bay SP.

RUTTING FALLOW DEER, AXIS DEER, MULE
DEER

Olema at the Vedanta Retreat Center.

RUTTING ROOSEVELT ELK

Pt. Reyes National Seashore, Grizzly Island SWA
on Suisun Bay, San Louis NWR north of Los Banos,
Wild Horse Sanctuary outside Red Bluff Tule Elk
State Reserve near Modesto.

WILD TURKEYS

Olema at the Vedanta Retreat Center.

NOVEMBER/DECEMBER

SANDHILL CRANES

Wetlands of Central Valley, Delevan NWR south
of Willows, Consumnes River Preserve out of Sac-
ramento, Woodbridge Road Ecological Preserve,
George Hatfield SRA, Merced NWR, Los Banos
Wildlife Area.

SHORE BIRDS

See May.

WINTERING BIRDS ON WILDERNESS PRESERVES

See January.

ALL YEAR

CALIFORNIA SEA LIONS. MALES VOCALIZE ALL
YEAR

Pier 39, San Francisco, early morning. Monterey
Pier; Pt. Lobos.

HERONS AND EGRETS

Elkhorn Slough NERR.

OCEAN SOUNDS

Pebble Beach, San Mateo County for sizzling
sounds.

WESTERN GRAY SQUIRRELS AND COMMON
RAVENS.

Shingle Mill Preserve*

**Shingle Mill Preserve is a small private preserve in
the Santa Cruz Mountains. Access can be arranged
through Janet Doell (510)236-0489 or Doell4@slip.net*

Some abbreviations definitions:

NERR=National Estuarine Research Reserve

NWR=National Wildlife Refuge

RP=Regional Park

SP=State Park

SRA=State Recreation Area

SWA=State Wildlife Area

*The author thanks Paul Matzner for his invaluable
contribution of facts, time, and advice in the prepara-
tion of this Seasonal Calendar.*

Photography by Richard Doell

The Music of Nature and the Nature of Music

Patricia M. Gray, Bernie Krause, Jelle Atema, Roger Payne, Carol Krumhansl, Luis Baptista

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Our world is filled with innumerable natural sounds, and from the earliest times humans have been intrigued and inspired by this "soundscape." People who live close to nature perceive a wider range of sounds than those of us living in industrialized societies, who rely heavily on advances in sound technology. The sounds of whales in the ocean, for example, were first recorded in the 1940s, yet the Tlingit, Inuit, and other seafaring tribes have been hearing them through the hulls of their boats for millennia. Similarly, the ultralow frequency communications of elephants have only just been recorded even though the Hutu and Tutsi tribes of central East Africa have incorporated these sounds into their songs and stories for centuries.

It is said that every known human culture has music. Music has been defined as patterns of sound varying in pitch and time produced for emotional, social, cultural, and cognitive purposes (1). Is music-making in humans defined by our genes? Do other species show musical language and expression? If they do, what kinds of behavior invoke music-making in these animals? Is there evidence in the animal kingdom for the ability to create and recreate a musical language with established musical sounds? How are musical sounds used to communicate within and between species? Do musical sounds in nature reveal a profound bond between all living things?

THE MUSIC OF NATURE

Whales. The undersea songs of humpback whales are similar in structure to bird and human songs and prove that these marine mammals are inveterate composers. If songs can be defined as "any rhythmic repeated utterance, whether by a bird, a frog, an insect, a whale or a human being" (2), then humpback whale songs are constructed according

to laws that are strikingly similar to those adopted by human composers.

- Singing humpbacks use rhythms similar to those in our own music, yet they could just as easily formulate free-form, arrhythmic sounds.
- They use phrases of a similar length to ours--a few seconds--and create themes out of several phrases before singing the next theme. Their songs could easily "grow" organically without the need for repetition but, like human composers, these marine mammals prefer to reiterate their material.
- Whale songs fall between the length of a modern ballad and that of a movement of a symphony. Perhaps they have chosen the same length of performance as we have because, with their large cerebral cortex, they have a similar attention span to humans.
- Even though they are capable of singing over a range of at least seven octaves, humpbacks use musical intervals between their notes that are similar to or the same as the intervals in our scales.
- Whales mix percussive or noisy elements in their songs with relatively pure tones, and do so in a ratio similar to that used by humans in Western symphonic music.
- In some whale songs, the overall song structure is similar to human compositions: a statement of theme, a section in which it is elaborated, and then a return to a slightly modified version of the original theme (that is, the ABA form).
- The tone and timbre of many whale notes are similar to human musical sounds. With an infinitude of possible sounds to choose from, whales

could easily prefer to make sounds that we would deem unpleasant (roars, stutters, grunts).

- Most surprisingly, humpback songs contain repeating refrains that form rhymes. This suggests that whales use rhyme in the same way that we do: as a mnemonic device to help them remember complex material (2).

The fact that whale and human music have so much in common even though our evolutionary paths have not intersected for 60 million years, suggests that music may predate humans--that rather than being the inventors of music, we are latecomers to the musical scene.

Birds. Advances in audio technology allowed the late Luis Baptista to draw fascinating parallels between bird song and human music (3). For instance, when birds compose songs they often use the same rhythmic variations, pitch relationships, permutations, and combinations of notes as human composers. Thus, some bird songs resemble musical compositions; for example, the canyon wren's trill cascades down the musical scale like the opening of Chopin's "Revolutionary" Etude.

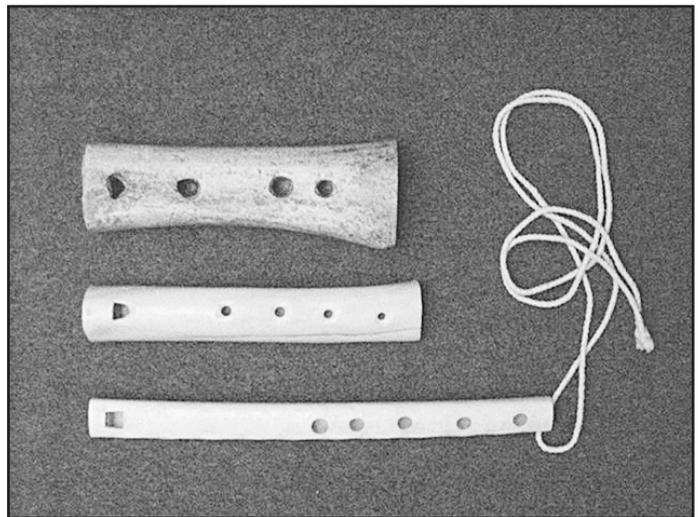
An examination of bird song reveals every elementary rhythmic effect found in human music (4). There are interval inversions, simple harmonic relations, and retention of melody with change of key. Many birds regularly transpose motifs to different keys (5). Some birds pitch their songs to the same scale as Western music, one possible reason for human attraction to these sounds. For example, notes in the song of the wood thrush (*Catharus mustelina*) are pitched such that they follow our musical scale very accurately (6). The interval between the first and second parts of the song of a ruby-crowned kinglet (*Regulus calendula*) is often a full octave. The canyon wren sings in the chromatic scale (which divides the octave into 12 semitones) (7) and the hermit thrush (*Catharus guttatus*) in the pentatonic scale (which consists of five different tones within the octave) (8).

The simple melodic canon, a frequent device in human composition based on imitation, is reminiscent of the matched countersinging of many bird species. The Socorro mockingbird (*Mimodes graysoni*) of Mexico sings a long series of short themes and its immediate neighbor will then respond to each theme with the identical theme (9). The Cali-

fornian marsh wren (*Cistothorus palustris*) may sing as many as 120 different themes in a fixed sequence. Each theme is matched by its neighbor in a leader-follower sequence (in music this is known as the call-response pattern) (10).

Not all bird sounds emanate from the vocal tract--some are produced with "instruments" such as special feather structures, others by the bird pounding on an object with a "preferred" resonance. Perhaps the most remarkable example of a bird using an instrument to produce sound is that of the palm cockatoo (*Probosciger aterrimus*) of Northern Australia and New Guinea (11). Each male breaks a twig from a tree, then shapes it into a drumstick. The bird selects a hollow log with a preferred resonance and then, holding the stick with its foot, drums on the log as part of its courtship ritual.

Humans. Human music-making may vary dramatically between cultures, but the fact that it is found in all cultures suggests that there is a deep human need to create, perform, and listen to music.



No bones about Neanderthal music. Reconstructions of (top) a 53,000-year-old Neanderthal flute made of bear bone found in Slovenia (possibly recorder type), (middle) a 30,000-year-old French deer bone flute (most likely recorder type), and (bottom) a 4000-year-old French vulture bone flute (definitely recorder type).

It appears that our Cro-Magnon and Neanderthal ancestors were as fond of music as we are. The discovery of prehistoric flutes made of animal bone in France and Slovenia, ranging in age from 4000 to 53,000 years old, demonstrates that ancient civili-

zations devoted considerable time and skill to constructing complicated musical instruments (see the figure). Reconstructions of these prehistoric flutes suggest that they resemble today's recorders (12). It is possible that these ancient instruments even had a sound-producing plug (a fipple), making them easier to play but more difficult to make. Remarkably, many different types of scales can be played on reconstructed prehistoric flutes, and the sounds are pure and haunting. Given the sophistication of these 50,000-year-old instruments, it is quite possible that humans have been making music for several hundred thousand years.

The oral tradition of the Sami--the indigenous people of the northern Scandinavian Peninsula and the Kola Peninsula of present-day Russia--is contained in exclusively vocal songs called yoiks (13). Yoiks--consisting of short repeated cycles of nonsense syllables without linguistic meaning--describe everyday life and always carry personal meaning for the yoiker. Although not described in words, the topic of a yoik may be a person, livelihood, an animal, a place, or an aspect of nature. It is believed that musical knowledge is acquired in part by the internalizing of frequently repeated patterns in a particular musical style, thereby enabling listeners to abstract recurring commonalities from the music that they hear (13). The ability to memorize and recognize musical patterns thereby creates learned oral traditions that are passed on to subsequent generations.

MUSICAL COMMONALITIES

The ability to memorize and recognize musical patterns is also central to whale and bird music-making. These learning patterns may be vertical traditions (when a behavior is passed from parent to offspring), oblique traditions (when adults who are not blood-related pass the culture to younger generations), or horizontal traditions (when peers learn from each other).

Vertical musical tradition, such as the Sami yoik, is found in all human cultures and in several finch species, including the zebra finch (*Taeniopygia castanotis*) and the Northern bullfinch (*Pyrrhula pyrrhula*). Oblique musical tradition is the central component of every music lesson and is probably the most widespread mode of learning songs among birds (14). Horizontal musical tradition is found on every children's playground, in

hand-raised juvenile chaffinches (*Fringilla coelebs*), white-crowned sparrows (*Zonotrichia leucophrys*), and in Anna's hummingbirds (*Calypte anna*), which when raised together develop very similar songs (14). Horizontal transfer of songs is also found among humpbacks--every whale in the same breeding area sings the same song and the song slowly evolves from year to year (2), but whales from different oceans sing completely different songs. By comparing any given whale song with a collection of song tapes, the year and the ocean from which the songs came can be identified. A recent report documented the extraordinary finding that the arrival of a few humpbacks from the Indian Ocean (Australia's west coast) to the Pacific Ocean (Australia's east coast) resulted in the resident Pacific whales ditching their own song in favor of the newcomer's ditty, a transformation that was complete within 3 years (15).

UNIVERSAL MUSIC

Ambient sound is a central component of natural habitats. Abstracting the voice of a single creature from a habitat and trying to understand it out of context is a little like trying to comprehend an elephant by examining only a single hair at the tip of its tail (before cloning, of course). The ambient sound of an environment mimics a modern-day orchestra: the voice of each creature has its own frequency, amplitude, timbre, and duration, and occupies a unique niche among the other musicians (16). This "animal orchestra" or biophony represents a unique sound grouping for any given biome and sends a clear acoustical message.

Musical sounds form an exciting, natural conduit between members of our own species, between our species and others, and between the arts and sciences. By looking at musical commonalities, our understanding of music is enlarging, and by viewing musical sounds as an intuitive, nonverbal form of communication, we can better understand our own development in a biodiverse world.

It has been postulated that there is an unproven (and probably unprovable) concept called mathematical Platonism, which supposes that there is a universal mathematics awaiting discovery. Is there a universal music awaiting discovery, or is all music just a construct of whatever mind is making it--human, bird, whale? The similarities among human music, bird song, and whale song tempt one to

speculate that the Platonic alternative may exist--that there is a universal music awaiting discovery.

It is not known when the ancient art of making music first began. But, if it is as ancient as some believe, this could explain why we find so much meaning and emotion in music even though we cannot explain why it makes us feel the way it does. Such an impenetrable vagueness about this most basic of human creations seems to signal that the roots of music lie closer to our ancient lizard brain than to our more recent reasoning cortex, that music has a more ancient origin even than human language.

REFERENCES AND NOTES

1. The BioMusic Program is a program of National Musical Arts (NMA), the resident ensemble of the National Academy of Sciences. The program emerged from NMA's involvement in the National Forum on BioDiversity conference co-hosted by the National Academy of Sciences and the Smithsonian Institution in 1986. It now serves as a think tank for a diverse group of scientists and musicians. The BioMusic Program is a unique conduit between art and science, as it seeks to examine music in all species and to explore and understand its powerful role in all living things. This Perspective summarizes presentations at the BioMusic Symposium held as part of the American Association for the Advancement of Science Annual Meeting (17 to 22 February 2000, Washington, DC). We dedicate this Perspective to our colleague Dr. Luis Baptista (deceased July 2000) [AAAS meeting program] .
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Studying The Effects of Acoustics on Marine Mammals

by Amy S. Bohorquez

Ed. Note: Amy spoke at the NSS 17th Annual Field Workshop in June 2000. This article updates her work with Harbor Seals that is part of the Richmond Bridge seismic retrofit.

Within the general public, many people do not realize the impact sound has on wildlife, and how variations in sound can be detrimental to natural populations. The impacts of sounds underwater are often ignored because we do not hear them as often as airborne sounds. Marine mammals use sounds in water and in air to forage, identify members of their own species, keep in tight groups as well as stay in contact over long distances. Understanding how these animals utilize sound and how anthropogenic noise affects their lives is an important aspect of their overall protection.

Even with the increasing interest in marine mammals, our knowledge of the full use of these sounds is still unknown for some species. Within cetaceans (whales and dolphins), many people are familiar with humpback whale songs. However, not many people know that these songs change on a yearly basis, and are used by males as part of a singing contest to demonstrate strength and endurance as an attraction to a potential mate. Blue whales also may use vocalizations to find each other over long distances. Many of these animals are solitary and communicate with each other using vocalizations that can be heard up to 1,000 miles away. Increases in underwater sounds through the open ocean may interfere with communication between these whales over long distances.

Dolphins use sound for everything from foraging to communication within their pod. They use sound to forage by making a series of high-pitch squeaks that are then bounced off solid objects and allow the dolphin to identify what is around them, even when it's dark and cloudy. This use of echolocation helps dolphins to find food in sand and in the water column. They communicate between each other in terms of where food may be, location of the pod and the presence of danger. There is even evidence that they may use these sounds to punish calves when they misbehave by producing the same high pitched sound directly on the calves sides. Anthro-

pogenic noise can interfere with these animals communicating with each other and staying together if traveling in pods.

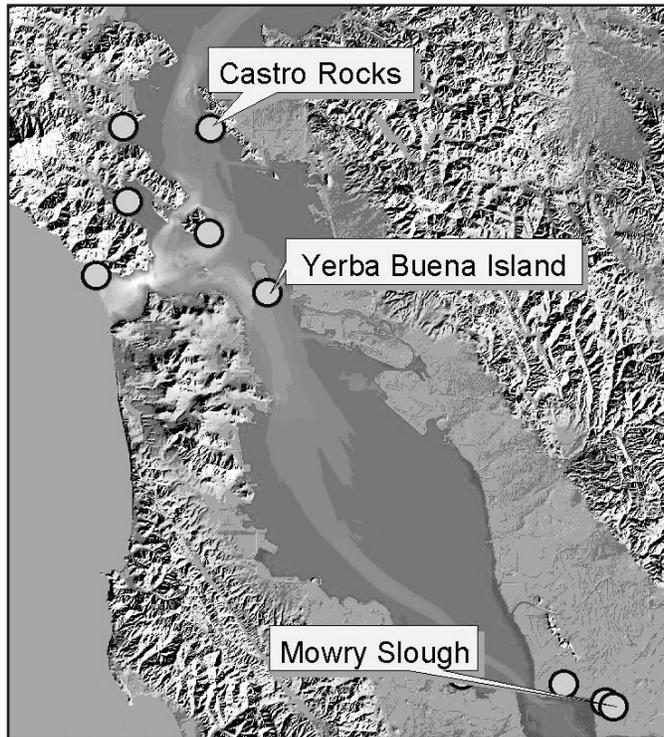
Like cetaceans, pinnipeds (seals, sea lions, fur seals and walrus) produce sounds to communicate with each other, protect territories, and bond with their young. Vocal recognition in seals and sea lions is crucial to the success of the pup. Mothers and pups of many pinniped species use vocalization in and out of the water to stay in contact. In species where the mother leaves the pup on land, vocal recognition is crucial to the rejoining of the pair. If the pup is young and separated from its mother, it will more than likely starve. Increases in underwater and airborne sound can increase separation between mother and pup pinnipeds, reducing survivorship.

San Francisco has a harbor seal population of about 500 animals that spend their time on rocks and beaches within the bay. Oddly, this population has not grown in numbers over the last fifteen years while coastal colonies of harbor seals have grown up to 10%. This lack of population increase within the bay may be due to a reduction in available resting space, or haul out space. With increases in human population size in the area and human encroachment on the water lines, many harbor seal haul out sites are threatened. We have already lost one site within the bay due to increases in human activity.

With the seismic retrofitting of the bridges within the San Francisco Bay, we will see an increase in human activity in the areas surrounding the bridges and an increase in airborne and underwater sound. In an attempt to protect our local population, Caltrans has funded a five-year project to monitor harbor seals before, during and after the construction. Under this study, we are monitoring the three largest haul out sites within the bay, Castro Rocks, Yerba Buena Island and Mowry Slough. We are

also tracking the harbor seals with radio and satellite telemetry so we can follow their movements through out the bay to determine foraging and alternate haul out sites.

Seals need haul out space for many behavioral activities including resting, molting, and pupping. These areas are characterized by proximity to food resources, access to water and lack of disturbance. Using the time the seals spend on land, researchers can estimate local population size and monitor the animal's behavioral repertoire. By measuring the seal's responses to human activity, we can determine what types of disturbances have the greatest impact on the seals.



Harbor Seal haulouts in San Francisco Bay, with the sites being monitored in this study labeled. Map courtesy of Barry Nickel.

Castro Rocks is the primary site for our study due to the close distance of this haul out site to the Richmond-San Rafael Bridge. This site is adjacent to the southeast corner of the bridge directly across from the Chevron Pier and serves as one of the most frequented sites year round. This is also the second largest pupping site within the bay, with an average of 35 pups over the last three years. Because of the proximity to the bridge, this site maybe the most threatened by the retrofitting construction. There are two sites that may be likely alternatives to this site, if abandoned. These are Yerba Buena Island and Mowry Slough.

Yerba Buena Island serves as an active site, especially in the winter months during the herring run through the bay, but is not a pupping site. Here, the seals haul out on a sandy beach and rocky point close to the lighthouse on the south side of the

island. With the Oakland-San Francisco Bay Bridge running through the middle of the island, construction may pose a threat to this site as well. However, the cove-like nature of the area may provide some protection.

Mowry Slough, in the south bay, is a series of haul out areas within an intricate slough. Much of this land is USFWS National Refuge land or private land owned by Cargill Salt, so there is reduced human disturbance. Mowry Slough is the largest pupping site with pup numbers close to three times more than what is seen at Castro Rocks. Although this site is not far from the Dumbarton Bridge, it is unlikely that construction activity will affect the seals.

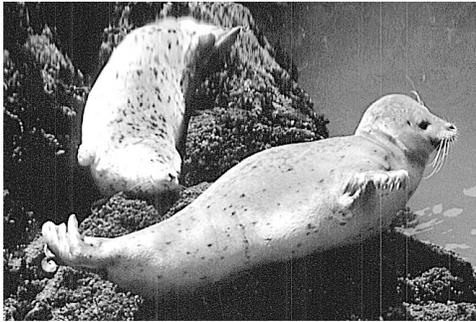
At Castro Rocks, the retrofit construction will entail increases in airborne and underwater sounds as well as an increase in boat activity around the bridge. The work conducted will occur at the bases of the

piers under the bridge, which is extremely close to the haul out site. Work is restricted during the pupping, breeding and molting season in an attempt to minimize detrimental effects. However, increases in activity now may be limiting the number of seals that will be using the site during those seasons.

Seals respond to potential danger with a visual scan of the area (head alert). If the danger seems real, they will approach the water and if necessary, leave the site (flush). If the danger is a false alarm and they have flushed the site, the seals usually return quickly to the haul out, however, repetitive false alarms increase energy expenditure of the seals and can lead to the abandonment of the site. A higher tendency to flush at the slightest provocation also results in an increase in mother-pup separation. Although some reunions do take place, permanent separation of mother and pup within the first week

of the pup's life usually lead's to death within two weeks.

Within the project we are monitoring how the seals respond to different activities through out the day and night. We are not only looking that the behavioral response, but the distance that the disturbance source was when the response occurred. With this information we can produce a threshold of disturbance, or 'how far away can activities be before they negatively impact the seals'. This way we can be specific about the types of disturbance that should



Harbor Seal mother and pup.

be limited near haul out sites.

Using airborne decibel readers and hydrophones around the bridge, we are monitoring the difference in sound before during and after the construction. It is

our intention to compare the recorded sound data with behaviors of the harbor seals to find more exact sound ranges that cause disturbances. For instance, loud high-pitched sounds seem to elicit a response more often than low rumbles. These devises can help us to determine if this is true.

Protection of these three sites is crucial to the health and reproductive success of the harbor seal population in the San Francisco Bay. The overall response

of the seals to the retrofit still remains to be seen. The retrofit will last several years and there is still a lot of work to be done. Hopefully, with this ongoing study, we can apply the knowledge we have gained to make suggestions for mitigation for this and future construction projects.

Often times potentially threatening human activities are necessary for the protection of the local human population, like seismic retrofits. We can try to conduct these activities in ways that are least disturbing to the local wildlife. For all of these reasons and more, protecting the acoustic landscape for marine mammals is of grave importance. It is becoming increasingly more important to learn as much as we can about how marine mammals respond to increases in noise. With this knowledge, we can also learn the best ways to protect them

Amy Bohorquez has been working with the harbor seals in the San Francisco Bay since 1994. She has now been working with Caltrans for the past 4 years, and is a masters candidate in the biology department at San Francisco State University. She started her work in both biology and music at Mira Costa Community College in Oceanside, California. She continued her studies in both fields at Mills College in Oakland, California, where she continued working in sound recording and finished her bachelor's degree in biology in 1996. Since then she has presented data concerning her work in the bay to the Society for Marine Mammology (1999 and 2001), the Animal Behavior Society (2000 and 2001) and the Society for Conservation Biology (2001).

Book Announcement

NSS Member Frank Dorritie reports that in early 2002 his book, "*Handbook of Nature Sound Recording*" will be published by Mix Books (ArtistPro).

This book will include some of the history of field recording, a bit of theory, discussion of gear and formats, and techniques for recording natural ambience, birds and land mammals, cetaceans and ocean sound, news and enents, oral histories, and some laboratory exercises. It will come with a companion CD with samples ranging from Peter Paul Kellogg and Arthur A. Allen's famous Ivory-billed Woodpecker recording from 1935, to steam locomotives, to South African field bands and to Rudy Trubitt's sound montage, "Fog Pond."

Greeting the Dawn with the Nature Sounds Society

by Cathryn Hrudicka

A briefer version of this article was originally published in Film/Tape World Magazine, as the "Click Track" Audio Column, August 2001.

It's 3:00 a.m., and my friend and I are groping around in a tent with a flashlight, searching for our socks and a Sennheiser ME-80 short shotgun mic attached to a piece of pipe tubing covered with foam pipe insulation, which acts as a type of make-shift boom. Between my backpack and boots is the WM-D6 Sony Pro-Walkman cassette recorder in its carrying case. It has been a solid, trusty companion in other parts of the world that are too humid or dusty for DAT recorders, although here at the San Francisco State University Sierra Field Station, the DATs and MiniDiscs should work well, as long as it doesn't rain.

We are here with several dozen members of the Nature Sounds Society, a world-wide organization based in the Bay Area, whose principal purpose is to encourage the preservation, appreciation and creative use of natural sounds. Its members include recording engineers, biologists, museum professionals, conservationists, sound designers, musicians, artists, radio broadcast specialists, bird-watchers and just plain nature lovers.

CAPTURING THE DAWN CHORUS

Often, at home, I'm still awake at 3:00 a.m. from the previous day's work, an incurable night owl. It's really weird for me to get up then to record "the dawn chorus" in a meadow near Yuba Pass that is a short drive from the camp. Slathering on mosquito repellent and sunscreen-which we won't need for several hours-we emerge like drowsy field mice from our cars, quietly assembling all manner of mic rigs and recording equipment, ranging from a Nagra IV-STC, a Nagra 4.2, and two Sony cassette recorders, the WM-D6 and WM-D6C, to a variety of DATs

including the Sony TCD-D8, the TCD-D100, the portable Pro PCM-M1, among others. There are also several MiniDisc recorders, including the attractive and sturdy purple HHB MDP500. I am envious of one participant's small Sharp MiniDisc, the MD-MT877, which looks really sleek and light at 16.8 millimeters, and he says it had proven to be quite reliable in the field. Another participant swears by his Marantz PMD60.



Zach Scribner, intern at Dan Dugan Sound Design

One of the many great features of this annual Field Trip is that Nature Sounds Society veterans provide an array of equipment and mentoring for those who are nature recording novices, or who don't have their own equipment. You get to borrow and try out different rigs than you may have previously used. This brings me to Location Recording Lesson #1-always assemble and audition your recording gear before you go into the field. On the previous

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night, we had an opportunity to choose and test the equipment we wanted to try. Because I love purple, and had never used one, I chose the HHB MDP500 MiniDisc and one of the new Audio-Technica AT895 adaptive mics, which I had carefully rigged and auditioned. Observing Lesson #2, always make sure your batteries are recharged, I am disappointed to find that overnight, the mic case had somehow been separated from the HHB MDP500 in the equipment room, so now I have to scramble and borrow another mic on location. Lesson #3-always make sure all of your equipment cases are organized and grouped together, and that you have all the cables, headphones, discs, mic pres and other accessories you will need.

As I breathe in the fresh, cool air and feel energized by the sight of my cohorts trooping into the field with all manner of gear, I find to my dismay that the HHB MDP500 keeps crashing-it won't let me record at all, despite our having recharged the batteries. Fortunately, I am able to ask one of the attentive NSS tech mentors, Sound Designer Rudy Trubitt, for help, and he tells me that the software needs upgrading, even though the MDP500 is less than a year old-something that obviously, I couldn't do in the field. Lesson #4-make sure your MiniDisc software is the most current version, and bring a back-up recording device, just in case. After attempting several fixes, in the interest of capturing the Dawn Chorus at dawn, I travel back in time to the Sennheiser ME-80, with the WM-D6 Sony Pro-Walkman cassette and Sony MDR-V6 headphones, huddling in the heather with my companion. Once again, I am reminded that sometimes the best technology is the easiest technology-upon checking later, we got great recordings of the stunning Sierra meadow dawn biophony, with minimal tape and wind noise-our windscreen had worked well.

In all fairness to HHB, one of the other participants says he has found his MDP500 to be very reliable; but I wouldn't want to risk a crashing MiniDisc if I were on an important gig with a deadline, such as recording sound effects for a film. Of course, Nagra's are still the dependable workhorses of location recording, but they are larger and heavier to schlep around, especially if you are trying to be quiet while hiking some distance to capture a fleeting bird or animal.

We move to several other recording spots, in search

of quiet without highway traffic and excess wind. At a pond, we test a hydrophone-and underwater mic-and one participant sets up a mic rig in a coincident pattern on a rock mid-stream to capture a waterfall. When we return to camp, there is a line-up of excellent speakers and workshops, something to suit every participant's interests.

THE SOUND AND THE FURRY

Noted bioacoustician, composer, sound designer and audio producer Bernie Krause (<http://www.wildsanctuary.com>) explains in detail how natural sounds are layered in "orchestrations," produced and/or received by different species and sexes of animals, and that there is a purposeful series of patterns of sounds in each "soundscape" in nature. A specific soundscape is affected by factors such as location, geology, temperature, season, time of day, and increasingly, by the impact of human-made sounds on the environment, which can actually upset the behavior patterns of animals. Dr. Krause illustrates this intrusion with documentation of sound waves and other measurements before and after human impact. He says he is not recording individual animals now as much as the biophony, the interrelationships of different sounds and animal voices in a particular environmental ambience. His studies of how the intrusion of human sounds is endangering this balance have led to a new project with the National Parks Service. The ultimate goal is to document and preserve the biophony of National Park soundscapes, and to introduce visitors to sound as a component of their park experience.

THE SECRET SEX LIVES OF BUGS AND BATS

In one workshop with biologist and insect expert Bob Love, and in another with geologist and bat expert Curt Black, we learn that there's a lot we don't know about insects, and that most of the myths about bats are untrue-for instance, they don't get caught in your hair, and very few will actually bite your neck. In a humorous multimedia presentation, Black demonstrates that recording them requires a special bat detecting device, and the recordings require pitch and time shifting to hear, because many of their sounds are beyond the hearing range of humans.

Bob Love tells us amazing stories about recording the complex "orchestral arrangements" of sound

in the sex lives of crickets in Baja. One type of Costa Rican male cricket even has the intelligence to dig a "parabola"-shaped pit in the earth, which allows him to attract over-flying female crickets, thus demonstrating one of the many functions of insect sounds. Love points out how crucial it is to know why you are recording specific nature sounds, which will determine what you record, and which equipment you should use.

MICROPHONE ARRAYS AND NEW EQUIPMENT

Sound Designer, Nagra Service Rep, and all-round audio expert Dan Dugan (<http://www.dandugan.com>) walks us through two workshops about microphone arrays and new equipment on the market. He explains why and when you would set up specific microphones in cardioid, hypercardioid, binaural, bi-directional, Blumlein, or Mid-Side patterns, and mentors us as we test each configuration. In addition to demonstrating the Schoeps and Sennheiser models most often used, he shows us the new DSP-controlled, adaptive directional Audio-Technica mics that have

five changeable elements, and include both A to D and D to A converters. Dugan demonstrates some cool, recent mic pres by Sound Devices and other manufacturers. Later, he leads us in a thorough discussion about surround recording techniques

. At its conclusion, I leave the Field Trip feeling that I've really learned some valuable things about nature sound recording techniques, and I've come away with a new level of appreciation for the fragility and complexity of nature itself, reflected in its amazing sound orchestrations. I am more determined than ever to do my part to preserve the precious sounds and silences of natural ambiances, with minimal intrusion by humans.

Cathryn Hrudicka is a sound designer, composer and writer. She is a partner with NSS member Richard Links in Berkeley-based Links Audio and also freelances on film, video, radio, multimedia and Internet projects. She writes the audio column for Film/Tape World Magazine and has served as an editor and writer for a number of arts, music and audio publications. She can be contacted

Some Mark Griswold "cheapskate" audio tips

- 1) If you are using Audio Technica AT8415 shockmount, the rubber bands used to hold bunches of broccoli together are the perfect size to fit in this shockmount. They don't last as long as the original rubber bands, but I think they work better. Your recordings will also improve if you eat the nutritious broccoli.
 - 2) Pick up a package of ponytail holders at the drugstore. They look like elastic figure 8s with a plastic ball on each loop. They are the best cable ties you ever saw - and they're cheap (2 bucks a dozen).
 - 3) Call Sorbothane at 330-678-9444 and ask for a product sample. You will receive a small oval of their patented vibration absorbing rubber. Wrap thos around your mic when using an oversized mic clip (\$5 at Radio Shack) and you have a very inexpensive shockmount.
-

Music's Nature

By Dennis Hysom (dhysom@compozarts.com)

A number of field recordists and composer/musicians have experimented with interweaving natural sound and music. For those of you interested in audio projects that combine music and natural sounds, here are some specific links and titles. Many more can be found by going to www.google.com and doing a search under 'music and nature'. This incomplete listing is not a series of reviews, but rather a descriptive resource list for anyone who is interested in this type of work.



Stevie Wonder and Ray Charles bands, combined.

OCEAN ODYSSEY - soundscapes from oceanside at Big Sur. The journey goes from the shore, under the surface to the deep ocean home of humpback whales, several varieties fish and crustaceans, killer whales, and other deep ocean sounds, and back, again to the shore.

RHYTHMS OF AFRICA - soundscapes from Karisoke, the late Dian Fossey's research site in Rwanda, featuring her beloved mountain gorillas and the biophonies of the Virunga Mountains in which they live.

RAIN FOREST DREAMS - day and night soundscapes from the Amazon Basin with howler monkeys, jaguar, many kinds of rainforest birds, and tropical weather.

At EarthEar, (<http://www.EarthEar.com/catalog/music.html>) Jim Cummings suggested three titles. These are his descriptions:

FORESTS: A BOOK OF HOURS (Douglas Quin). Experimental composition, about half field recordings, interwoven with African choral, improvised woodwinds, and electronic passages.

BEFORE THE WAR (Douglas Quin and David Rothenberg). Earth jazz, moving with the deep rhythms of the earth.

GROOVED WHALE (Lisa Walker). New approach to music with whalesong: classically trained violinist plays and records her violin in areas with extraordinary underwater acoustics. Great original whale song recordings, as well.

A WILD CHRISTMAS - joyous Christmas music from around the world scored using only sounds that are biological. In other words, all the music sounds are created from the voices of animals. No synth. No traditional instruments. With arrangements by Phil Aaberg (former Windham Hill recording artist and keyboardist for Peter Gabriel), all of the music is set to show the versatility of bird song and dolphins as lead voices, fish performing percussion, and other creatures filling in for the voices of common instruments.

At Wild Sanctuary, <http://www.wildsanctuary.com> Bernie Krause suggests the following (please note that all titles can be purchased either off the Wild Sanctuary web site or by contacting Wild Sanctuary directly via e mail at chirp@wildsanctuary.com. The following three albums consist of natural soundscapes scored with music composed by Rodney Franklin (keyboardist for Stevie Wonder) and a select group of studio musicians from both the

GORILLAS IN THE MIX - like A Wild Christmas, this album was done as an example of the versatility of animal voices used for instrumental music performance. Like the description above, creatures make up the orchestra demonstrating their incredible range and performance capabilities. Done by Bernie Krause with his group, The Human Remains (Tony Mills, Matt Ward, Peter Escovedo, and others)

My CD's can be found at <http://www.northstarmusic.com> I also have MP3 and realaudio samples available at my website <http://www.compozarts.com>. The following descriptions are taken from the North Star site.

ANCIENT VOICES - Inspired by nature, these melodies are enveloped by lush orchestrations including recordings of loons, canyon wrens, red-tailed hawks, wolves and humpback whales.

GLACIER BAY- Alaska's Glacier Bay is brought to life in this combination of lushly orchestrated original music and natural sounds. The plaintive cries of wolves and the evocative songs of great whales, along with myriad birds and the mystical sounds of ice and water in their ceaseless slow motion dance.

PRAIRIE-The music combines original melodies, orchestrated for keyboards, guitars, cello, violin, harmonica, oboe, flutes, clarinet and percussion, with natural sounds recorded on location. The songs of canyon wren and meadowlarks, the howls of coyote and more, evoke the grandeur and scope of this lovely country.

BAYOU- Under a canopy of Cottonwood and Magnolia trees, a flat bottomed boat glides noiselessly atop the shallow water. Long curtains of moss float in the steamy air. The music combines original melodies, the rhythms and instruments of Louisiana's Cajun tradition, and a constantly changing soundscape of natural sounds recorded on location. Features guitars, keyboards, strings, clarinet, rubboard, fiddle and more.

OCEAN PLANET-This CD was inspired by the vastness and majesty of the world's oceans. The music is a blending of natural sounds, recorded on location, with original melodies arranged for guitars, strings, oboe, keyboards, flutes and more.

CARIBBEAN- Lush and tropical, the brilliance of the colors of flowers and birds - coral and fish, is matched by an equally rich sound canvas, recorded on location. The drama of a thunderstorm, the graceful sweetness of a mountain waterfall all seamlessly intertwined with beautiful original melodies, elegantly arranged for guitars, keyboards, strings, woodwinds, percussion and more.

The following titles can be found at Real Music <http://www.realmusic.com> :

LETTING THE WORLY GO BY - Part of the Sacred Spa Series. Various artists. Compilation. "Glowing health is our natural state. This CD from the Sacred Spa Music Series is comprised of an hour of music carefully selected to help you discover and strengthen your true essence, your Real Self-Beautiful music that nurtures all aspects of you being as you slip into the peaceful embrace of deep and pleasurable relaxation."

THE PACHELBEL CANON WITH OCEAN SOUNDS- Natures Classics Series by artist Anastasi. "The Nature's Classics Series is a sensitive blending of timeless musical creations with the magic of Nature's own elemental sounds. The result is a work uniquely suited to relaxation, reflection, or pure enjoyment. Pachelbel Canon in D is one of the most beautiful pieces in the western classical repertoire. Here it is combined with subtle ocean waves to bring forth its most deeply pleasurable and peaceful elements."

CINEMOCEAN - The CinemOcean Series by artist Anastasi. "On CinemOcean, Anastasi has taken ten of the most beautiful movie themes and masterfully arranged them into a poignant musical tapestry. Enhanced by the rhythmic caress of ocean waves, this album creates an ideal environment for relaxation, meditation, or for gently encouraging the magic of your own imagination."

You can find Real Music titles all over, Barnes & Nobles, Borders, Tower Records, Amazon.com, Virgin, Hasting, HMV, Best Buy, Sam Goody, Coco-nuts, Crows Nest, Baker & Taylor, Warehouse.etc

You can also purchase directly form Real Music online at realmusic.com or call 800 398-REAL (7325)

Also, be sure to check out: Dan Gibson's 'Solitudes' series at <http://www.solitudes.com>, and Dean Evenson's CD's at <http://www.soundings.com>

If you are aware of other titles or artists to add to this resource list, please send the information to editor@naturesounds.org or to the Nature Sounds Society, Oakland Museum of California, 1000 Oak Street, Oakland, CA 94607.

Snipes

Snipes winnowing in my head,
Streams coursing down my eyes, my nose:
These are the artifacts of a day
Well spent in the solitude of sound.

I heard them first in fields
Full of Marsh and Sage,
Surrounded by Cows and Cranes,
Soaring up and down with that
Gladness of wings,
The Wind rushing through their feathertips.

Like liquid creatures they rolled
Up to Heights and down
Diving hell-bent toward the grass below,
Pulling short and gliding to ascend again,
Their winnowing sending sparks down
My fingertips.

And now the day is over
I hear them still -- in kitchens,
In tall trees and skies covered by tents.
They banish sleep and fill my head
I drink the sounds,
I breathe them out --
Inspiring and expiring with
One breath.
And listening always.

The winnowing of snipes,
Of the grains of my life,
Thrown high in the Air
And descending with the reed of wings,
The chaff flying lightly in the Wind.

16 June 1988
Paul Matzner

News and Notes

(Compiled by Sharon Perry)

California Library of Natural Sounds Update

with CLNS Library Curator Paul Matzner

The California Library of Natural Sounds (CLNS) at the Oakland Museum of California (Oakland Museum) is the hosting organization for the Nature Sounds Society. The NSS was co-founded by Library Curator Paul Matzner in 1983, and makes its organizational home in the CLNS offices at the Museum. The CLNS has been undergoing a major media conversion from analog to digital format of its nature sound recordings over the past year and is now triumphantly re-emergent as a major archive with over 2,000 sounds in its catalog. This column will appear each issue to describe the current doings and resources of the CLNS.



But first, some history. The CLNS has been extant since 1971, shortly after the museum was established. Originally the archive was established to provide sounds for the natural sciences gallery but over time, the catalog grew through collection trips and recordings made by former Curator Bob Love and Paul Matzner, as well as other acquisitions. The catalog's uniqueness lay in the fact that it did not exclusively focus on species sounds; it recorded and collected ambient sounds for natural sound design. The Library became a renowned source of sounds for film, television, radio, theater, museums and other arts-related institutions as well as providing all sound design and installation for Oakland Museum exhibits. In 1987, the Library published its first CD ("Quiet Places: A Soundwalk Across natural California"). Special exhibits, such as the 1999 Cave exhibit in the Natural Sciences Gallery, required that Paul travel to caves in the Stanislaus River to record bat, water, and cave ambience sounds and artfully mix and present these sounds as part of the installation.

Over the past 30 years, the technology for recording

and storing sounds has changed tremendously. Much of the CLNS archive was maintained on reel-to-reel tape. Over time, this media began to deteriorate, suffering from a disease called "Sticky-shed Syndrome." A major hurdle for CLNS for a number of years was to obtain an adequate budget to do the necessary conversion to digital format, along with the attendant cataloging. By the time this funding was secured, the conversion had become a technical challenge as many tapes had become

too sticky to pull off undistorted sounds. The Library experimented with a baking protocol and through trial and error discovered that the right temperature could be provided by incubator ovens to separate and dry the strands of tape so they could be transferred without distortion of the sound. The last year has found Paul and his small army of interns busy with the sometimes tedious chore of baking tapes, converting the sounds, identifying the context and type of sound, and cataloging them to a database that provides source and cue information. In order to devote time to this conversion effort, the Library's sound request program had been on hold, but now with the project complete, the sound request program has been restarted. Sound requests can be taken and filled in a much shorter period of time than previously, and Paul's expertise with the context and ambience of any given sound is an equally invaluable resource. Additionally, the expertise gained in the development of a successful conversion technique is also proving to be a valuable resource to other institutions that face similar challenges.

In the next several months, the CLNS will be engaged in two major projects. First is the sound design and installation for the "Native Grandeur: Preserving California's Vanishing Land-

scapes" exhibit of approximately fifty evocative 19th and early 20th century paintings, drawn from public and private collections throughout the state. This exhibit will include works by William Wendt, Granville Redmond, Maynard Dixon, Thomas Hill, Paul Grimm and Guy Rose. Sound designers Paul Matzner and Jason Reinier will experiment with motion detectors and ambient sounds to create a unique soundscape for viewing and experiencing the art of these works. This exhibit will be held from November 17, 2001 - April 14, 2002 in the Oakland Museum's Natural Sciences Gallery. The second major project is the reissuing of the "Quiet Places" CD in time for the holiday season. The CD

will be available at the Oakland Museum bookstore and through the CLNS.

You can contact the CLNS and Paul Matzner as follows:

California Library of Natural Sounds (CLNS)
Oakland Museum of California
1000 Oak Street
Oakland, CA 94607
(510) 238-7482
clns@naturesound.org
or pmatzner@museumca.org

2000-2001 NSS Events Recapitulated

The events offered by the NSS are largely driven by the members both by suggestions and even more importantly, by their willingness to share their talents and their willingness to help in the planning and execution of events. During the past year, NSS has sponsored or co-sponsored the following events and classes to its members and the public based on the recommendations of the membership:

DECEMBER 16, 2000 - Very Basics of Recording (Rudy Trubitt, at the Oakland Museum of California)

FEBRUARY 10, 2001 - Año Nuevo Elephant Seal Trip

APRIL 7, 2001 - Very Basics of Recording (Rudy Trubitt, at the Oakland Museum of California)

MAY 5, 2001 - Tech Talk, Amy Hunter and Dan Dugan (Dan's studio, San Francisco) with assistance from Lyman Miller and Paul Matzner

JUNE 22-24, 2001 - 17th Annual Field Workshop (featured speakers: Dr. Bernie Krause, Bob Love & Dan Dugan) at the San Francisco State Field Station near Yuba Pass

AUGUST 25, 2001 Basic Editing Workshop (Rudy Trubitt, Jon Meyer) at Crissy Field in San Francisco

OCTOBER 18, 2001 Bird and Sound Identification, Cataloguing, and Recording Lecture by Paul Matzner at the Oakland Museum of California, with the Golden Gate Audubon Society

The brand-new class that Rudy developed and taught in December, April (and again this Novem-

ber for Crissy Field), the "Very Basics of Sound Recording," was very well received and proved to be the excellent lead-in to the Tech Talk members had been requesting. It will be reprised in April 2002 for the NSS membership.

Amy Hunter, a sound engineer and past Board Chair, coordinated and taught the May Tech Talk with Dan Dugan at Dan's studio, ably assisted by Lyman Miller, and Paul Matzner. The interchange between the presenters and the audience gave ample opportunity for recordists of all levels to benefit and was well-attended.

The June Field Recording Workshop was once again held at the SFSU Field Station near Yuba Pass. The planned speakers were Dr. Bernie Krause, internationally known for his work in bioacoustics; Bob Love, naturalist, trip leader, and teacher; and Dan Dugan, inventor and sound designer. As an added treat, Curt Black presented slides and sounds from his explorations of the bat world. The recording trips to Sierra Valley, Yuba Pass, and to Sand Pond offered three completely different environments for recording. At Sierra Valley and Sand Pond, Bernie treated what for most of us was our first opportunity to use a hydrophone and listen to a very different underwater world of sounds. The world is full of sounds you would never dream of!

In August Rudy and Jon Meyer taught "Basics of

Sound Editing" as a follow-up to the workshop. The NSS has long wanted to offer such a class, but previously lacked the instructor and the appropriate teaching facilities. With the inauguration of the Crissy Field Center, part of the Golden Gate National Recreation Area last spring, a beautiful computer laboratory and recording equipment were made available to NSS. The class size was limited so each student could have use of one of the sixteen computers. Rudy and Jon developed their curriculum around CoolEdit 2000, a good program for beginners and a good program with which to grow. Nina Sazevich of the National Park Service was instrumental in developing the relationship with NSS to facilitate this class.

A new recording event this year was a recording trip to the Elephant Seals at Año Nuevo in February of 2001. The first tour of the morning was booked exclusively for NSS and we had the colony all to our selves for thirty to forty minutes. The weather was blustery and a bit on the damp side, but those who attended enjoyed the opportunity to share ideas regarding technique and equipment over a bowl of artichoke soup in Pescadero after the rain.

The Events/Planning Committee, a group of about six to eight members, sought two goals over the past year based on the outcome of the August 2000 vision meeting:

1) Developing educational opportunities that would provide a progression for a interested recordist starting with the concepts of sound and audio recording, moving through equipment choices, recording techniques and microphone use, providing laboratory time to experiment with equipment, field recording opportunities and ultimately instruction in sound editing. Along the way, opportunities to learn about natural sound, species or elemental recording, and sound identification and cataloging would be made available.

2) Expanding the venues and affiliations by which these opportunities could be provided. Relationships with Crissy Field and the Golden Gate Audubon Society have resulted in stronger program offerings. Crissy Field's computer laboratory space, for example, made it possible to teach the basic editing in a hands-on environment.

Dan Dugan, Amy Hunter, Jon Meyer and Rudy Trubitt have been instrumental to the success of the NSS educational program over the year, devising curriculums, programs, demonstrations and exercises which have engaged and developed the knowledge and ability of those who participated. Bill Young, the Planning Committee Chair, spent countless hours working on event logistics: scouting potential field trip locations, talking with rangers and facilities managers, and working with the Events/Planning committee to develop a trip "script," publicity, and outreach efforts to assure the event was well-attended. Bill has unflaggingly acted as the NSS guide and host for events over the past year, giving a gracious welcome to all who attend or present.

The ability to meet the goals set and the success of the events themselves was also in no small part due to the efforts of the Planning/Events Committee, which meets every month to develop ideas and turn them into reality. Members of the Committee over the past year have been: Gayle Ashton, Lea Barker, Caroline Cleaves, Greg Demascio, Janet and Richard Doell, Jon Meyer, Xander Richaers, Sharon Perry and Rudy Trubitt.

This coming year we expect to continue the emphasis on education, and hope to offer more recording opportunities. Of course, we would be delighted to hear from you, our members, on what you would like, and whether you'd be able to willing to help us put together an event, suggest a location or just come along. We are looking forward to hearing from you.

(More World Wide Web Online Resources—see p. 44)

PHOTOGRAPHY

Kevin Fitz Patrick's page - <http://www.agpix.com/fitzpatrick> page lists information, images as well as ongoing news items. The site provides stock photography image sources to interested parties. Kevin's sound recording activities are also listed at this site.

World Wide Web Online Resources

What follows is a very incomplete list of online resources for the nature recordist divided into roughly defined categories. We welcome your suggestions and recommendations about sites that you have found interesting or helpful to you to add to this list. Additional sites are listed on the bookmarks page of the Nature Sounds Society listserv (see Listserves), compiled and generously provided by Cathryn Hrudicka. We are plan to set up a links page on the NSS website to include the following information for easy accessibility.

ACADEMIC/RESEARCH SITES

Cornell Lab of Ornithology Online Guide <http://birdsource.cornell.edu/onlineguide/>

This visual guide showcases the bird art, color photographs, and recordings from Cornell's Library of Natural Sounds. Users can find sound clips, illustrations, engaging and informative text, and range maps for species.

Bioacoustics Research Lab, University of Illinois <http://www.brl.uiuc.edu/>

Center for Bioacoustics Texas A & M University <http://bioacoustics.tamucc.edu/>

Centro Interdisciplinare di Bioacustica e Ricerche Ambientali (CIBA)(Interdisciplinary Center for Bioacoustics and Environmental Research), University of Pavia, Italy <http://cibra.unipv.it/welcome.html>

Bird Song Files: Selected Species <http://eebweb.arizona.edu/faculty/hopp/song.html>

This site, maintained by S. Hopp of Department of Ecology and Evolutionary Biology, University of Arizona, provides selected birdsongs (primarily vireos) and links to other websites maintaining birdsong information.

ASSOCIATION OR AFFINITY SITES

The Acoustical Society of America http://asa.aip.org/tech_com/ab.html

The Audio Engineering Society <http://www.aes.org/>

The Nature Sounds Society <http://www.naturesounds.org> Need we say more?

The National Audubon Society <http://www.audubon.org/> Links to Audubon local societies can be found through this web page. Golden Gate Audubon Society, the Marin Audubon Society, and the Diablo Valley Audubon Society provide programs and services to Bay Area birders.

The Oakland Museum of California <http://www.museumca.org>

World Forum for Acoustic Ecology <http://interact.uoregon.edu/MediaLit/WFAEHomePage>

This website provides a variety of links to research, art, quietude, music and natural environment sound, and organizations involved with sound.

GENERAL RESOURCE PAGES

Bioacoustics Links Page (British Library National Sound Archive) <http://www.zi.ku.dk/zi/bioacoustics/balinks.html>

LISTERVES

Nature Sounds Society listerve http://groups.yahoo.com/group/nature_sounds_society

The NSS listserve was started in July 2001 and currently has about 50 members. It is moderated by Rudy Trubitt, and helps members stay in touch, coordinate informal field recording trips, discuss equipment and further the work of the NSS. Non-members are welcome.

Nature Recordists listserve <http://groups.yahoo.com/group/naturerecordists>

The Nature Recordist listserve began in August 2000 and has about 230 members. It is a very active, internationally-attended listerve which focuses techniques, issues and general discussion of recording natural sounds. Topics include, but aren't limited to recording techniques and equipment, recording venues and discussions of various animal vocalizations and communication.

MUSIC/ARTS SITES

Dennis Hysom's site - <http://www.compozarts.com> Dennis' catalog of music and nature sound is presented as well as other creative services that he provides incorporating natural sounds. Dennis has been a NSS Workshop speaker and is currently a NSS Board Member.

Doug Quin's site - <http://www.dqmedia.com> dqmedia is a post-production company specializing in audio and multi-media design. Doug is a musician, recordist and composer whose CDs are available on the Earth Ear label. Doug is a regular contributor to the NSS bulletin and events.

NATURE/EDUCATION/SCIENCE/SYNERGY

Daniel Edelstein's site: <http://home.earthlink.net/~edelstein> Do you want to know the date of the next full moon and read about other sky and land seasonal nature "phenology" events, or tips on identifying warblers? This site has links to other science/nature sites. Daniel is an author, educator, and naturalist with a wide range of interests and accomplishments with an interest in identifying birds by ear. He is currently a NSS Board Member.

Dr. Bernie Krause's site: <http://www.wildsanctuary.com> Wild Sanctuary, your source for: Soundscape CDs representing biophonies worldwide; public space soundscape installations; bioacoustic monitoring and research; bioacoustic literature and publications; and Natural sound library licensing. Bernie is a long time supporter and member of NSS, 2001 workshop presenter and contributor.

SOUNDSCAPES

Jim Cummings' site, Earhear: <http://www.earhear.com/> This website provides an excellent compendium of activity in the soundscape arena. In addition to providing a catalog of nature sound recordings, as profiles of various artists working in the field, and a style primer, he also provides a guide to the socio-political aspects of quietude.

TECHNICAL

For assistance with technical problems or equipment, links to other technical sites, and a lot of great information about recording equipment and technical education, check these sites out:

Dan Dugan's site, Dan Dugan Sound Design <http://www.dandugan.com> Automatic microphone mixers, Nagra sales and service, tape recorder service, custom CDs for performance, CD mastering. Dan is a technical advisor to the NSS, the host of the NSS Tech Talk, and often speaks at the NSS Annual Field Workshop.

Adam Liberman's site, Liberman Sound: <http://www.libermansound.com> Production sound and pro audio equipment repair, alignment, design, and testing. DAT, cassette, open reel, and more. State of the art Audio Precision System Two Cascade analog and digital test set. Flatbed service for KEM, Moviola, and Showchron. Sound recording for film and video. Adam is a past NSS Chair, Annual Workshop leader, newsletter editor, and board member.

Rudy Trubitt's site: <http://www.trubitt.com> Among many other things, Rudy has taught the "The Very Basics of Nature Sound Recording" and "Basics of Nature Sound Editing" classes for NSS members. He moderates the NSS listserve. Rudy's site also includes his recording basics articles that were featured in the Summer 2001 and Winter 2001 bulletins.

Nature Sounds Society Survey Responses

Recently, in preparation for the October 8, 2001 annual meeting, the NSS Board sent the membership a survey to assess Nature Sounds Society programs and develop a blueprint for where that NSS can concentrate its energies in the next year. Between the individuals who took the time to attend the meeting and express their opinions and the returned written surveys, we had a response rate of 27%, an excellent return for this kind of query. A summary of those responses follows:

1. Areas NSS should focus on over the next year:

Overall, survey respondents felt NSS should provide more class offerings and field events. Suggestions were made at the annual meeting about ways in which NSS could partner with other individuals or organizations to provide a field trip experience with an expert in a specific natural science and/or technical field.

However, even more strongly, respondents felt that NSS should re-engage in its work with natural quiet and improve the offerings on the website. With regard to natural quiet, some respondents felt NSS could become more actively involved in monitoring the decline of quiet places and giving a more formal voice to concerns about that decline. Equally important as a priority was the need for more comprehensive and in-depth website content. Offerings suggested include a Basic Recording FAQ, pulling together much of the work that has already been done for the Questionbird column and other bulletin articles and a links/bookmarks page for additional resources, including a more prominent link to the Nature Sounds Society listserve.

2. The areas of interest that NSS provides the most

benefit to its membership were listed as:

Learning field recording and editing techniques and having access to equipment to try prior to purchase, particularly for a non-technical naturalists; field recording opportunities and trips; awareness of the loss of quiet places and that they are worth creating/protecting; and the need for all to reprioritize the senses -- engaging the ear first -- in nature appreciation.

3. The area in which NSS has been a disappointment:

While most respondents indicated that NSS has fulfilled their expectations -- in a number of cases exceeded them -- some suggestions were made that NSS program could include more natural science topics and more naturalist expertise during field trips. A naturalist presence could train recordists to sensing and understanding the natural environment (e.g., birdsong and animal identification, ambience, what to expect in a given habitat, and how to listen in a natural environment) so recording can be more scientifically, effectively and creatively accomplished. This influence will balance the technical material that is presented in the various workshops and classes.

The letter from the NSS Board in this issue outlines how these suggestions and issues will be incorporated into the Board and committee work in the upcoming year. The NSS Board of Directors extends its thanks and appreciation to all of you who offered your suggestions, opinions and support. It's not too late to express your opinion or offer to help: contact us at naturesounds@naturesound.org -- we would be happy to hear from you!

Nature Sounds Society Acknowledgements 2000-2001

The Nature Sounds Society (NSS) events and operations of the past year have been due only to the generous and unstinting contributions of its membership. The following is a non-comprehensive list that can only highlight the considerable time and support given by these individuals to the work of the NSS.

Gayle Ashton - Planning/Events Committee
Don Benson - NSS Treasurer (NSS Board)
Marge Benson - Office Manager, Membership
Lea Barker - Planning/Events Committee, Workshop
Curt Black - Workshop Speaker
Gregory DeMascio - Planning/Events Committee, NSS Board
Mike Diltz - Workshop Intern, Sierra Valley/Yuba Pass CD Sound Mix Presentation
Richard Doell - NSS Bulletin Layout Editor, Planning/Events Committee
Janet Doell - Planning/Events Committee, NSS Bulletin contributor
Daniel Edelstein - NSS Board
Dan Dugan - Tech Talk host and speaker, Workshop speaker and equipment consultant/source, NSS Bulletin Questionbird columnist, guiding technical light
Paul Feyling - NSS Bulletin Editor (Fall 2000)
Dr. Bill Gilbert - NSS Bulletin Editor (Fall 2000) and contributor
Ruth Henry - Planning/Events Committee
Cathryn Hrudicka - Bulletin contributor
Dennis Hysom - NSS Board
Amy Hunter - Tech Talk Coordinator
Elon Khalif - Basic Sound Editing technical support
Marty Kent - Webmaster
Dr. Bernie Krause - Workshop Speaker, NSS Bulletin contributor
Bob Love - Workshop Speaker
Adam Liberman - Technical Consultant, Workshop equipment source
Paul Matzner - Museum Liaison, Tech Talk laboratory
Jon Meyer - Basics of Sound Editing co-teacher, Planning Events Committee
Lyman Miller - Tech Talk laboratory, Workshop
Dave Parks - Workshop Intern
Sharon Perry - NSS Board, Planning/Events Committee, NSS Bulletin Editor (Spring 2001), Communications Chair
Doug Quin -- NSS Bulletin Contributor
Xander Richaers - Planning/Events Committee
Nancy Rieser - Financial contributor, Events contributor
Jay Salter - NSS Bulletin Editorial Committee and contributor
Zach Schribner - Workshop Intern
Rudy Trubitt - Teacher, Very Basics of Sound Recording, Basic Sound Editing, Workshop Technical Coordinator, NSS listserv founder and moderator, Planning/Events Committee, NSS Bulletin contributor
Bill Young - NSS Board, Planning/Events Committee Chair

Questionbird

by Dan Dugan
questionbird@naturesounds.org

Dan is an inventor and sound engineer who works in his laboratory in San Francisco. He manufactures his own inventions, services sound equipment for the film industry, and does music editing for dance companies (ballet, modern, ethnic) and ice skaters. He is the inventor of the automatic microphone mixer and the Northern California Nagra specialist. He is a technical advisor to the NSS, the host of the NSS Tech Talk, and often speaks at the NSS Annual Field Workshop.

Q: WE (MY NEIGHBORS) AND MYSELF HAVE A PROBLEM WITH INLAND SEAGULLS, THAT RETURN FOR MATING AND NESTING EVERY YEAR. NOT ONLY ARE THEY VERY LOUD, BUT THEIR DROPPINGS ARE MESSY, AND MAY POSE A HEALTH PROBLEM, THEY ARE ALSO VERY TERRITORIAL, ACTUALLY SWOOPING DOWN ON RESIDENTS WHEN THEIR YOUNG HATCH.



I HAVE HEARD THAT THERE ARE VARIOUS "SOUND" DEVICES AVAILABLE THAT EMIT THE TONES OF THE SEAGULLS NATURAL PREDATORS, AND THUS FRIGHTEN THEM OFF EVENTUALLY. ANY INFO ON THESE SOUND DEVICES, SPEAKERS ETC, WILL GREATLY BE APPRECIATED.

THANKS,

JAN G

A: We NSS types usually want to -attract- birds. A Google search produced the following:

Distress call repeller described in:

<http://www.foodtechsource.com/catkx/KX-139.pdf>

Bird deterrents of all kinds:

<http://www.thomasregister.com/olc/birdbgone/>

Ultrasonic deterrent:

http://www.whateverworks.com/bird_gard.htm

They claim their owl decoy drives away seagulls at:

<http://www.yankeeharvest.com/northcountrybells/>

There's an article about pest birds at:

<http://www.dscp.dla.mil/subs/proserv/PestNote/pestbird.pdf>

Though they mention seagulls they don't give any repellents for them. Perhaps you could contact the authors.

Ovidiv Todor ovidiv@radiant.net claims to repel seagulls with trained hawks.

Q: I WOULD BE MOST GRATEFUL FOR REFERENCES/SOURCES OF INFORMATION ABOUT THE FREQUENCY RANGE OF AUDITORY PERCEPTION IN BIRDS. IN PARTICULAR, ARE YOU AWARE OF A COMPILATION OF SUCH RANGES FOR COMMON EUROPEAN BIRDS, THUS FAR I HAVE ONLY BEEN ABLE TO TRACK DOWN SOME GENERAL STATEMENTS OF RANGE ACROSS SPECIES.

MANY THANKS,

ALLAN WILLIAMS

A: I spoke with Robert Bowman, biologist at San Francisco State University. He said not a whole lot is known, but in general maximum sensitivity is in the 1K to 5K frequency range, with not much response above 10K (there are exceptions). He suggests the best reference might be the first volume of "Acoustic Communication in Birds" by Kroodsma and Miller, from Academic Press.

From Rob Bond, a series of questions for the beginning recordist:

Q: I'VE BEEN THINKING ABOUT GETTING INTO RECORDING NATURE SOUNDS AND HAVE JUST DISCOVERED

YOUR WEBSITE. I'M WONDERING WHAT SORT OF REASONABLY-PRICED, DECENT QUALITY RECORDERS I SHOULD BE CONSIDERING TO START OUT WITH. THE ANSWERS ON YOUR BOARD SEEM TO SUGGEST THAT DAT IS THE WAY TO GO. IF SO, WHAT BRANDS (IN ADDITION TO SONY) SHOULD I BE LOOKING AT?

A: The lowest budget recorder would be a Marantz cassette recorder. In the digital class (better sound), you'd want a DAT or MD recorder. A great resource on what's available in MD is at:

<http://www.minidisc.org>

And DAT information is at:

<http://www.solorb.com/dat-heads/Links.html>

Q: WHAT EQUIPMENT WOULD I NEED TO EDIT DAT? WOULD A PC BE USED FOR THIS?

A: Yes, you would use a PC or Mac to edit your recordings, with Digital Audio Workstation (DAW) software.

Q: ARE MANY (OR ANY) PEOPLE STILL USING ANALOG EQUIPMENT FOR THIS? IS DAT NOTICEABLY CLEARER?

A: If you do everything right you can get an excellent recording on cassette. Doing everything right means high quality tape on a machine that has been calibrated by a specialist for that particular brand and type of tape, using Dolby B or C.

Reel-to-reel analog is still being used in studios for a significant proportion of music recording. It alters the sound in subtle ways that artists like. The quality of the medium matters; for example, photography didn't replace oil painting. Reel-to-reel analog is still being used in some motion picture location recording, by recordists who prefer its higher reliability.

Digital (DAT or MD) have higher recording quality (lower noise, flatter frequency response, lower distortion), but overall the systems are less reliable; i.e. the chances of coming back with -nothing- are higher with digital, which tends to be like little girls in the nursery rhyme; "when they are good they are very, very good, but when they are bad they are horrid."

Q: I KNOW SOME ELECTRONICS AND I'M WILLING TO DO SOME STUDYING ON THIS SUBJECT (RECORDING AND EDITING), BUT I'M NOT SURE WHAT PUBLICATION(S) TO READ. I FEEL IT SHOULD BE PRETTY RECENT TO TAKE THE LATEST DEVELOPMENTS INTO ACCOUNT, BUT I DIDN'T REALLY SEE ANYTHING THAT JUMPED OUT AT ME ON AMAZON.COM'S SITE. ANY TIPS FOR A BEGINNER WHO REALLY WANTS TO LEARN?

A: We need to have a recommended reading page on our web site, with sections for beginners and for experts. I'll ask Paul Matzner what he recommends for beginners. For computer workstation information, you can't beat reading Mix magazine and EQ magazine.

Q: I'M TAKING A TRIP TO TAHOE LATER THIS YEAR, AND INTEND TO MAKE RECORDINGS OF NATURE'S SOUNDS THROUGH MY LAPTOP. I'M GOING TO BE USING A DIGIGRAM VXPocket V2, AND I'D LIKE TO KNOW WHAT SET OF MICROPHONES AND MIC/LINE BATTERY OPERATED PREAMPS WOULD BE SUITABLE IN ORDER TO OBTAIN PROFESSIONAL STEREO RECORDINGS. I'D ALSO LIKE TO USE THIS SAME SETUP LATER TO RECORD OTHER TYPE OF SOUNDS, SUCH AS CITY SOUNDS, ETC. THANKS IN ADVANCE FOR YOUR ATTENTION.

BEST REGARDS, RUBEN J. SOTO HERNANDEZ

A: the choice of microphones is first a question of style. There are three basic styles to choose from.

1) Binaural recording. This is done with microphones mounted on your head or on a dummy head. Advantages: incredible 3-D "you are there" quality when listening on headphones. Disadvantages: may sound too distant when played on speakers unless you record with this in mind. No control over perspective except moving to the right place.

2) "Classical" stereo recording with an M-S, X-Y (one-point stereo mikes) or an ORTF mike array (pair of mikes on stereo bar). Advantages: Easy to handle the mike or mike pair. Some directionality allows concentrating on the subject and reducing less desirable elements of the soundscape. Considerations: M-S and X-Y are mono compatible but don't sound spacious on headphones. ORTF sounds great on both speakers and headphones but gets phasey in mono.

QUESTIONBIRD

3) Super-directional recording with a long shotgun or parabolic dish microphone. Advantage: ability to pick out subject from background. Disadvantages: tight directionality requires close attention to pointing the mike. Mikes are large and heavy. Difficult to make a stereo perspective.

Sorry it's not as simple as saying "get a model XX mike"!

My favorite preamp (and I sell it so I'm not an unbiased source of information) is from Sound Devices (<http://www.sounddevices.com>), the MP-2. It gives you low-noise preamps, decent metering, and a pro headphone amp. It'd be a good front end for your VXPocket.

Q: I'M TRYING TO SECURE A COPY OF A RECORDING OF A COMPOSITION BY MR. FASSETT SOMETIME IN THE FIRST HALF OF THE 20TH CENTURY. I BELIEVE THAT THIS PIECE OF MUSIC WAS CONSTRUCTED ENTIRELY OF BIRD SOUNDS. DO YOU KNOW ANYTHING ABOUT THIS? OR CAN YOU STEER ME IN THE RIGHT DIRECTION?

MUCH THANKS!

WENDY LEVINS

A: A Google search found a page about the Ficker release of Jim Fasset's "Symphony of the Birds" recording:

http://www.showandtellmusic.com/pages/galleries/gallery_g/fasset2.html

See also:

<http://www.spaceagepop.com/fasset.htm>

I searched a few out-of-print sources without success. Maybe one of the nature sound libraries has a copy. A contemporary example of this technique is Bernie Krause's "Gorillas in the Mix."

Q: HELLO DAN!

DURING THE RECENT NSS FIELDTRIP TO YUBA PASS, YOU MENTIONED A COMPANY THAT MAKES AIRCRAFT NOISE REDUCTION HEADSETS WITH SONY V6 DRIVERS MOUNTED INSIDE.

COULD YOU PLEASE GIVE ME THE NAME/CONTACT INFO FOR THAT PRODUCT AGAIN?

A: They're called SuperPhones. See <http://www.gk-music.com>

Another approach altogether is earplug phones from Etymotic Research:

<http://www.etymotic.com>

Lyman Miller swears by them. He prefers the model ER-4S.

Q: I'M BUILDING A STEREO MIC CABLE TO BRING TO THE YUBA RIVER TRIP. NORMALLY I USE CANARE "STAR QUAD" FOR MONO MIC CABLES, AND I'M WONDERING IF THERE IS ANY REASON NOT TO USE "STAR QUAD" CABLE, BUT USING EACH CONDUCTOR FOR DIFFERENT PIN ON THE XLR-5. IS THIS A GOOD IDEA?

IF THIS IS A BAD IDEA, CAN YOU SUGGEST SOMETHING ELSE?

MARK GRISWOLD

A: It will work fine that way.

Q: I'M A MATURE STUDENT IN THE UK. MY STUDIES INCLUDE SONIC ART I COMPOSE EXPERIMENTAL, AMBIENT MUSIC TO ACCOMPANY, FOR EXAMPLE, EDUCATIONAL/COMMUNITY ART INSTALLATIONS, AND ALSO MUSIC FOR HOLISTIC HEALERS/THERAPISTS. I HAVE SPENT A LOT OF TIME JUST LATELY TRYING TO FIND OUT WHAT I THOUGHT WOULD BE EASY-TO-FIND BASIC INFORMATION - BUT IT DOESN'T APPEAR THAT WAY AT ALL ! BASICALLY, HAVING JUST READ YOUR BRILLIANT WEB PAGES WITH INTEREST I WONDER IF ANYONE THERE CAN HELP ME SOLVE THIS PROBLEM ? I WANT TO LISTEN TO, AND RECORD, THE INTERNAL SOUNDS THAT A TREE MAKES - IT'S "HEARTBEAT." FOR EXAMPLE, DO I NEED TO USE A STETHOSCOPE, AND, IS IT POSSIBLE IN SOME WAY THAT THE SOUNDS CAN BE RECORDED ? ANY INFORMATION AT ALL YOU MAY BE ABLE TO HELP ME WITH WILL BE SO USEFUL.

A: You need to use what is called a "contact mike," or vibration pickup, one that is designed to hear vibrations in what it is attached to, not in the air.

http://www.hollywoodedge.com/libfiles/thelib_44.html

<http://fstewart.ne.mediaone.net/DaEtiAiMcohnsCompaniesNews.shtml>

<http://www.silcom.com/~planet5/erinys/contactmic.html>

<http://www.accusound.com/contact-mike.htm>

<http://store.yahoo.com/spytechagency/11287.html>

<http://www.earmark.com/microphones.htm>

Ann Kroeber is an NSS member, and we can put you in touch with her. The Piezo contact mikes (Radio Shack) have a sound of their own, metallic and pingy, but they're cheap.

The main thing to do is experiment! Bark will be different from the core of the tree. You might drill a hole, or drive a spike into the tree and attach the mike to that. Let us know what you hear!

Q: FROM DAVE HARGIS: ARE THERE ANY GOOD BOOKS AVAILABLE THAT WOULD GIVE A BEGINNER SOME TECHNICAL BACKGROUND IN WILDLIFE/OUTDOOR RECORDING TECHNIQUES? I'D LIKE TO KNOW MORE ABOUT SUCH THINGS AS TIMING DIFFERENCES BETWEEN CHANNELS AND MIC SPACING.

A: Stereo mike arrays have been a hot topic since stereo was invented, and there is still no general agreement on what is best; rather the types of arrays define the style differences between different music and nature recordists.

Books recommended by the Macaulay Library of Natural Sounds at Cornell:

"Practical Recording Techniques"

Bruce & Jenny Bartlett

Mix Bookshelf 1992

6400 Hollis Street

Emeryville, CA 94608

Phone 800-233-9604

Fax 510-923-0369

<http://www.artistpro.com/>

"The Recording Studio Handbook"

John M. Woram

ELAR Publishing Company, Inc., 1982

Plainview, New York

"Sound Recording Practice"

John Borwick

Oxford University Press, 1980

"Sound Recording"

John Eargle

Van Nostrand Reinhold, 1976, 1980

Q: ALSO, ARE THERE MICS THAT YOU WOULD RECOMMEND THAT WOULD WORK WELL FOR CAPTURING INDIVIDUAL BIRD OR OTHER ANIMAL SOUNDS BUT THAT COULD ALSO BE USED IN COMBINATION WITH ANOTHER MIC TO GET A SPACIOUS FEELING FROM A LOCATION? I'D LIKE TO SPEND IN THE NEIGHBORHOOD OF \$1000 OR LESS PER MIC.

A: A shotgun mike can be made into a modified M-S array by adding a bidirectional mike for the S-channel. Technics has new short and long shotgun M-S stereo mikes made just that way that we tried at the 2001 workshop. For proper M-S technique the mid (M) and side (S) mikes must be very close together. But people break rules all the time in audio with excellent results. If you're recording with a parabolic or shotgun mike to one channel, why not add another mike on the other channel to pick up the ambience. It could be mixed in opposite phases to the two channels with the main pickup in the middle, perhaps with a time delay to align the center signal.

Q: MY NAME IS MICHELLE AVALLONE AND I AM A BIOLOGY GRADUATE STUDENT AT COLUMBIA UNIVERSITY. I AM SEEKING ADVICE ABOUT RECORDING AND PLAYBACK EQUIPMENT. I STUMBLED UPON THE NATURE SOUNDS SITE THOUGHT THAT NATURE SOUNDS WOULD BE A GOOD ORGANIZATION TO ASK ADVICE FROM. ANY HELP OR GUIDANCE THAT YOU COULD GIVE ME WOULD BE GREATLY APPRECIATED BECAUSE I KNOW VERY LITTLE ABOUT RECORDING EQUIPMENT BUT I AM EAGER TO GO. FOR MY DISSERTATION RESEARCH (WHICH I AM DOING IN KENYA), I WILL BE STUDYING BLUE MONKEY RESPONSES TO PREDATORS, THEIR MAIN PREDATOR BEING THE CROWNED HAWK EAGLE. I AM PLANNING ON BOTH PLAYING BACK CROWNED HAWK EAGLE CALLS TO BLUE MONKEYS IN THE FOREST AND RECORDING THEIR SUBSEQUENT BEHAVIOR (A PLAYBACK EXPERIMENT) AND ALSO RECORDING BLUE MONKEY ALARM CALLS.

PREVIOUS PLAYBACK EXPERIMENTS HAVE USED THE FOLLOWING EQUIPMENT: A SONY WM D6C PRO WALKMAN, BOSE 151 OUTDOOR SPEAKERS, NAGRA DSM AMPLIFIER. I CANNOT FIND ANYONE WHO SELLS THE NAGRA AMPLIFIER. DO YOU HAVE ANY

QUESTIONBIRD

OTHER SUGGESTIONS REGRADING OTHER AMPLIFIERS THAT ARE COMPARABLE TO THE NAGRA DSM?

FOR RECORDING BLUE MONKEY ALARM CALLS, OTHER STUDIES HAVE USED THE SONY WALKMAN WMD6C AND A SENNHEISER 70 MM DIRECTIONAL MICROPHONE (ME 88). WOULD YOU SUGGEST DIFFERENT EQUIPMENT FOR RECORDING?

DO YOU HAVE SUGGESTIONS FOR DIFFERENT EQUIPMENT THAT I SHOULD CONSIDER (REMEMBERING THAT THERE IS NO ELECTRICITY AT THE FIELD SITE WHERE I WILL BE DOING MY WORK). I AM LOOKING FOR EQUIPMENT THAT IS NOT TOO UNWIELDY AND THAT IS RUGGED (THE TRIP TO THE FIELD SITE IS BOUNCY AND ROUGH).

A: I sell the Nagra DSM, which is a speaker/amplifier. I'm not clear why you were using the Bose speakers, because the DSM is an all-in-one system. The DSM is \$3,890.00.

For the playback, a high-quality name-brand boombox (I'm running out of hyphens) would do the job and leave enough money left over to fund a month in the field. You could use cassettes or make a CDR of the predator calls for higher fidelity and ease of cueing.

The Sony Walkman WMD6C with the Sennheiser 70 mm directional microphone (ME 88) is a good combination, assuming you're using name-brand tape of the type that the Walkman is calibrated for, and your microphone to mini-plug adaptor is wired right. You could upgrade your fidelity by using a DAT machine like the Tascam DA-P1, but it wouldn't be as reliable and I'd recommend you carry the WM-D6C along as backup.

Everything mentioned is up to a "rough and bouncy" unless you intend to let it bounce around on the floor of the Land Rover unprotected.

Q: *This next series of questions is from Larry Rabin.* DEAR MR. DUGAN, PAUL MATZNER OF THE NATURE SOUND SOCIETY REFERRED ME TO YOU. I AM A GRADUATE STUDENT AT THE UNIVERSITY OF CALIFORNIA AT DAVIS IN THE ANIMAL BEHAVIOR GRADUATE GROUP. FOR MY DISSERTATION, I WILL BE STUDYING HOW NOISE CREATED BY ELECTRICITY GENERATING WIND TURBINES AFFECTS CALIFORNIA GROUND SQUIRREL VOCALIZATIONS. ALONG THESE LINES, MY RESEARCH WILL REQUIRE THAT I RECORD SQUIRREL VOCALIZA-

TIONS IN HIGH WIND CONDITIONS. BECAUSE OF THIS (AND BECAUSE OF A SERIOUS LACK OF FUNDING) I AM LOOKING FOR INEXPENSIVE WAYS TO ADDRESS THE PROBLEM OF MAKING GOOD RECORDINGS IN VERY WINDY CONDITIONS. CURRENTLY I AM CONSIDERING BUYING A SHOCK MOUNT/BLIMP/WINDSOCK FOR MY SENNHEISER ME80 MICROPHONE.

A: These will be necessary.

Q: HOWEVER, THE COST IS QUITE HIGH FOR ME. ALTERNATIVELY, I AM CONSIDERING USING A HIGH PASS FILTER TO REMOVE LOW FREQUENCY WIND NOISE DURING RECORDINGS.

A: It isn't an alternative; you need both the zeppelin and a high-pass filter.

Q: I WAS WONDERING IF YOU 1) COULD GIVE ME ADVICE ON THE APPROPRIATENESS OF EITHER OF THESE SOLUTIONS;

A: Use both.

Q: 2) KNOW HOW MUCH A GOOD HIGH PASS FILTER WOULD COST AND;

A: What recorder are you using? Most recorders designed for field work have a switchable high-pass filter built-in. You can rent a Nagra economically.

Q: 3) HAVE ANY OTHER CREATIVE SOLUTIONS WHICH MIGHT ADDRESS MY SITUATION

A: You can build your own shockmount and zeppelin out of chicken wire and fake fur fabric. Enclosed is a picture of a rig built by NSS advisor Lyman Miller.

Q: HI, I AM RESEARCHING THE MEANS TO RECORD ROCKY MOUNTAIN ELK. THE QUESTION IS WHETHER A PARABOLIC SETUP WOULD BE BETTER TO PICK UP THEIR SONG ACROSS A LARGE EXPANSE OR A LONG SHOTGUN. I HAVE A DA-P1 THAT SUPPLIES PHANTOM POWER AND OFFERS XLR INPUTS, WHICH SHOULD OPEN UP THE POSSIBILITIES.

GLEN HUMMEL

A: At great distances, I don't think you really have an image to focus a super-directional mike on; the sound is coming by multiple reverberant paths. Super-directional mikes have lousy off-axis

response, and off-axis sound will be a significant part of the distant sound experience. I'd suggest trying a supercardioid or short shotgun. You'll get enough directionality to reduce sounds of your recorder and stomach grumbling, but also good fidelity over a medium wide field. An M-S stereo short shotgun would be neat. A higher output mike will lower the mike preamp noise in the recording. Don't forget the shockmount, zeppelin windscreen, and fuzzy windscreen, but only use as much screening as necessary for the conditions.

I'm copying this question to some other experienced recordists who may have different opinions.

[Bernie Krause chimes in]

I'd use a real M-S system for elk, Dan.

[A "real" M-S system uses a cardioid pattern for the forward-facing "M" pickup, and a bidirectional mike for the side "S" pickup.]

Either that or a good SASS or omni stereo. My experience is that you can't get close enough for a clear focused shot, anyway, and they use the environment to transmit their signals reverberating throughout the forest...the real magic of the sound in the first place. I would go for the widest possible spread.

-Bernie Krause

Q: HI DAN AND BERNIE, I REALLY APPRECIATE THE FEEDBACK ON THIS SUBJECT. I AM A NOVICE AT THIS, DUH, AND WOULD LIKE OF COURSE TO NOT BE. FIRST TIME OUT I USED A BINAURAL MIC SETUP WITH MY MINIDISC. THE S/N WAS HORRIBLE AND THE ACTUAL

SOUND SO FAINT THAT I COULDN'T, EVEN WITH THE HELP A SOUND ENGINEER FRIEND ISOLATE ANYTHING WORTHWHILE.

A: Sounds like something was wrong, like having the mikes plugged into the line input, or dead batteries in the mikes, or mikes not compatible with the type of power supplied by your recorder.

Q: I AM HOPING THE DA-P1 WILL HELP, BUT I KNOW THE MIC IS THE KEY. I AGREE THE MAGIC OF THE SOUND IS THE WHOLE ENVIROMENTAL ACOUSTICS BUT BECAUSE OF MY FIRST EXPERIENCE I HAD THE IDEA I NEEDED SOMETHING MORE DIRECTIONAL FOR THE ELK THEMSELVES AND POSSIBLY A SECOND MIC FOR THE ENVIROMENT. YET THE BOTH OF YOU SAY THE REAL M-S SYSTEM WILL AFFORD ENOUGH PICKUP TO CAPTURE THE ELK AT A DISTANCE. AND SINCE YOU ARE BOTH INVOLVED WITH THIS TYPE OF RECORDING I HAVE TO LISTEN TO YOU. ALL THE MUSIC TYPES ARE SAYING SHOTGUNS ARE THE ONLY WAY, YET ODDLY ENOUGH THEY DON'T SELL THESE MICS.

A: Don't listen to music types on this.

Q: ARE THERE ANY SUGGESTED M-S SYSTEM NAMES I SHOULD LOOK FOR?

A: For low-level sounds you want a high-output mike. Schoeps is the best (except for humid environments), though they don't make an M-S mike, they have a special clamp to mount two mikes for M-S. Neumann has a stereo mike RSM-191. Audio-Technica has several choices, <http://www.audiotechnica.com/guide/type/index.html#stereo>. Shure VP-88 (is it hot enough? Try before you buy). I don't think Sennheiser has an M-S yet, nor AKG. Sony ECM-MS5, ECM-MS907?

(More World Wide Web Online Resources—see page 44)

Sound and Soundscapes

California Library of Natural Sounds - <http://www.museumca.org/naturalsounds/> A Sound Walk Across California provides sound clips and species/habitat information on the animal denizens of California.

Doug von Gausig's website - <http://www.naturesongs.com> This site is a resource for sounds of North and Central American bird and animal sounds and recording tools and techniques. Doug is the moderator of the nature recordist's listserve

Upcoming Events and Activities

Upcoming Nature Sounds (NSS) Society Events Winter 2001-Summer 2002

This is a partial list of events for NSS over the next year. More are in the planning stage. Check the NSS website, <http://www.naturesounds.org> for more current information as it becomes available for these events. Alternatively, call (510) 238-7482 or e-mail events@naturesounds for more information.

Saturday, February 9, 2002, Elephant Seals at Año Nuevo. NSS plans to purchase all slots on the first guided tour of the day, so the only people on this tour will be recordists. This is an excellent opportunity to learn field preparation techniques (equipment checks, appropriate protection arrangements for wind and rain) to take advantage of the unique sounds of elephant seals in a limited recording window and in potentially adverse weather conditions. February is the last good opportunity of the season to record all members of the elephant seal family before migrations begin. Participants will meet at the Visitor's Center at Año Nuevo at 8:15 and will depart promptly at 8:45. Only 20 slots are available, so call early to reserve a place. We will meet afterward in Pescadero for lunch and discussion.

Saturday, April 20, 2002 10 a.m. to 4 p.m. The Very Basics of Sound Recording. Crissy Field Center, San Francisco, CA. Can't tell a Mini-Disc from a Microphone? This 100% math-free workshop and demonstration will teach you the basics of sound recording in the wild. Topics include: the basics of sound, audio recording, equipment selection and use, common problems and solutions, editing and sharing your sounds. The only prerequisite is an interest in sound recording. The instructor is sound and music technology author, audio producer, musician, and field recordist Rudy Trubitt. Spaces are limited; call NSS for reservations.

Saturday, May 18, 2002, Tech Talk, Dan Dugan's Studio, San Francisco, CA, 10 AM - 2 PM. While this class is designed for recordists with intermediate to advanced experience, beginners are also welcome and will benefit from the discussion. Topics include audio and signal flow, microphone selec-

tion, proper microphone usage, and how to avoid common mistakes. This session is excellent preparation for the Annual Field Recording workshop in June. It will be held in the San Francisco laboratory of noted inventor, Dan Dugan. Spaces are limited; call NSS for reservations.

Friday-Sunday, June 21-23, 2002, 18th Annual Field Workshop, San Francisco State University Field Station, Yuba Pass, CA. The workshop will be held at the Sierra Nevada Field Campus of San Francisco State University alongside the scenic north fork of the Yuba River. The event, which is still in the initial planning stages, will offer informative lectures by professionals or academics in the field of bioacoustics, biology, music, or other related areas, and field trips by experienced sound recordists and the opportunity to use a variety of different kinds of equipment. Ample opportunity will exist to use the information gained during the Tech Talk and Basics classes. Additional information will be available in January 2002.

Saturday, August 10, 2002 (date tentative), Basic Editing Workshop, Crissy Field Center, Golden Gate National Recreation Area (GGNRA), San Francisco, CA, 8:30 AM -12:30 PM. Have you ever recorded a great sequence of bird-song marred by an annoying drive-by? Do you have hours of sounds, but nothing short enough to play for friends? It's time to learn the basics of sound editing, using CoolEdit 2000 software. In this four-hour class, you'll learn to transfer recordings from DAT, MiniDisc or cassette to a computer, then edit, layer and mix the results. Each student will have their own computer on which to work; the entire class will hone their skills using the same supplied sound samples. Only sixteen seats are available for this class, so call or email the NSS to request a slot. Leave contact information so we can confirm your reservation.

Other Events of Interest, Winter 2002

What follows is a partial listing of local special events and walks; and expeditions and conferences planned through the winter by various organizations which an interest in or affinity to nature

and nature sound issues. It is by no means inclusive. For a full schedule of free events and activities in the Bay Area, see the East Bay Regional website at <http://www.ebparks.org>, the Golden Gate Audubon Society website at <http://www.goldengateaudubon.org/BirdingExcursions/FieldTrips.htm>, the Ohlone Audubon Society website at <http://member.aol.com/OhloneAudubon/OASTrips.html> or check local listings in daily and weekly newspapers.

Other useful websites include:

Oakland Museum <http://www.museumca.org/>
Coyote Hills Regional Parks

<http://www.ebparks.org/parks/coyote.htm>

Crissy Field Center (Golden Gate National Recreation Area) <http://crissyfield.org>

Golden Gate National Recreation Area (GGNRA) <http://www.nps.gov/goga/>

California Academy of Science

<http://www.calacademy.org>

September 21, 2001 - February 3, 2002, "Wetland Wonders," Exhibit Lindsay Wildlife Museum, 1931 First Avenue, Walnut Creek, CA 94596, (925) 935-1978 or <http://www.wildlife-museum.org>

November 17, 2001 - April 14, 2002 Native Grandeur: Preserving California's Vanishing Landscapes, Natural Sciences Special Gallery, The Oakland Museum of California, Oakland, CA. Many painters have celebrated California's natural scenic and biological diversity. This exhibition of approximately 50 evocative 19th and early 20th century paintings, drawn from public and private collections throughout the state, includes works by William Wendt, Granville Redmond, Maynard Dixon, Thomas Hill, Paul Grimm and Guy Rose. A narrative surveys the accomplishments of the modern conservation movement and the challenges that still face it. Organized by The Nature Conservancy of California. Sound design by Paul Matzner, audio engineering by Jason Reinier.

Friday, November 30 - Monday, December 3, 2001, Audio Engineering Society (AES) 111th Convention, Jacob Javits Center, New York City, NY. Contact <http://www.aes.org/> for more information about conference meeting dates and arrangements. This event was rescheduled from its original September 21-24th date.

Saturday, December 1, 2001, 9:30 am -4:30 pm,

"Winter Birds of Tomales and Bodega Bays," California Academy of Science. Starting in Bodega Bay and car-caravanning to Tomales Bay, this field trip will focus on bird identification and behavior in several different habitats (rocky shore, mudflat, and beaches) which provide wintering homes for thousands of loons, grebes, scoters, and other waterbirds. Cost is \$40 for Cal Academy members, \$45 for non-members. Call Cal Academy at or contact them via their website at <http://www.calacademy.org>

Friday, December 7, 2001 , 8 PM "Bird Songing: The Ecology of Birds' Songs and Identifying Them By Ear" a presentation by birder, naturalist, science writer, educator (and NSS Board Member) Daniel Edelstein. Bay Audubon Sanctuary, 376 Greenwood Beach Road, Tiburon, CA. Call (415) 435-6357 or (415) 461-6133 for more information.

Saturday and Sunday December 8 - 9, 2001, San Francisco Bay Area Fungus Fair, Natural Sciences Side Bays, Oakland Museum of California. Up to 1000 specimens of local mushrooms presented in displays indicative of their natural habitats, reveal the beauty, smells, tastes and intricacies of the world of mushrooms. There will be presentations on mushroom hunting and identification-including how to distinguish the deadly mushrooms from the choice edibles, exotic mushrooms, medicinal uses of fungi, fungal diseases like Sudden Oak Death and "sick building syndrome," toxicology and psychedelic fungi. Presented in collaboration with the San Francisco Mycological Society.

Saturday, January 12, 2002, Grey Whales of the Monterey Bay, Cheeseman's Ecology Safaris. Tour the Monterey Bay on the 80 foot boat New Holiday with the Cheesemans. Monterey Bay is home to whales, leatherback turtles, 5 species of dolphins and a number of species of pelagic birds. Cost is \$60. Contact Cheeseman's Ecology Safaris at 1-800-527-5330 or at <http://www.cheesemans.com> for this trip or for information about the many other trips they offer.

January 27-February 9, 2002. "Costa Rica III-A Naturalist's Delight" Oakland Museum of California field trip. See the wonders of Costa Rica with an expert naturalist guide and an emphasis on environmental education, wildlife and ecology. The trip will be filled with boat trips and tours to see rivers, volcanoes, cloud forests, crocodiles and sloths, and

UPCOMING EVENTS

ends with three days at one of Costa Rica's most luxurious resorts. Contact Info: Natural Sciences Guild 510/238-3884

Saturday, February 2, 2002, 9:30 am - 5 pm "Cranes in the Valley, Eagles in the Hills," California Academy of Sciences will take a field trip to the eastern San Joaquin/Sacramento Valley region, to view sandhill cranes, shorebirds, geese, ducks and other waterbirds. A side trip to the Sierra foothills via car-caravan will take in raptors and their habitat. \$40 for Cal Academy members, \$45 for non-members. Call (415) 750-7100 or contact the website <http://www.calacademy.org>

Sunday, February 3, 2002, 8:30 am - 5 pm "California Delta Cruise," California Academy of Science. Traveling on a 50' boat, participants will view raptors, water birds, and other winter migrants finishing their season in the Delta before heading north. Cost is \$95 for Cal Academy members, \$105 for non-members. Call (415) 750-7100 or contact the website <http://www.calacademy.org>

Saturday, February 9, 2002, 8 am - 12:00 noon "Birding at Las Gallinas Ponds," California Academy of Science. This will be a two-mile walk

along easily accessible levees to view wintering water birds as well as hawks and upland birds. \$30 Cal Academy members, \$35 non-members. Call (415) 750-7100 or contact the website <http://www.calacademy.org>

Thursday, February 14, 2002 "Bird Songing: The Ecology of Birds' Songs and Identifying Them By Ear" a presentation by birder, naturalist, science writer, educator (and NSS Board Member) Daniel Edelstein. Lecture will be held at Randall Museum, 199 Museum Way, San Francisco, 94114 (415) 554-9600. Sponsored by the Golden Gate Audubon Society. For more information, phone (510) 843 2222 or check out the website, <http://www.goldengateaudubon.org/>

Thursday, May 9, 2002, 7:30 pm (arrive early) "Bats!" by Curt Black at Strybing Arboretum, Golden Gate Park, San Francisco, CA. Curt will lead a walk to view and discuss bats and their behavior. This will be an excellent field opportunity for folks who attended the 2001 Annual Field Workshop and saw Curt's lecture on bats. Sponsored by the Golden Gate Audubon Society. For more information, phone (510) 843 2222 or check out the website, <http://www.goldengateaudubon.org/>

(Continued from inside back cover)

c) provide a model for others to easily implement in their geographical areas.

In each of these new activities -- as well as our established activities -- our success will depend on the time and energy provided by our members. With continued growth in member participation we believe we can make the NSS not only viable but a significant element in the area of natural sounds/acoustic recording. We look forward to hearing from you about what you would like to contribute to our efforts. You can reach us at 510-238-7482 or by e-mailing naturesounds@naturesounds.org

Wishing you the best and happy listening,

The NSS Board
Don Benson, Treasurer
Greg DeMascio (at large)
Daniel Edelstein (at large)
Dennis Hysom (at large)
Sharon Perry, Communications
Bill Young, Events and Planning

Letter from the Board of Directors

Dear Nature Sounds Society (NSS) members,

Last year - in August 2000 -- the NSS held an all-member meeting in which we (the Board) challenged the members to help us over the next 12 months to make the Nature Sounds Society a viable organization or be prepared for the NSS to close down. Our position was that the potential for survival was dependent on the active participation of other members, particularly those who were actively involved in some aspect of nature sounds and recording.

Until interested members came forward and started participating in leadership roles with their ideas and energy, our goals were to focus on refining the existing operations to create a firm foundation for those whom we hoped would follow us in the leadership roles. Specifically our goals for the following 12 months were to:

1. Clarify and expand our program - Our education and field trip programs primarily benefit members who live in and around the San Francisco Bay area and can travel here for these events. We expanded our programs to include more sessions in basic recording and a session addressing the basics of sound editing. We began developing a database to support organizing recording trips, and one of our members created and moderates a new listserv to provide a forum to organize and disseminate information about field trips and other matters of interest to nature sound recordists. The address is http://www.groups.yahoo.com/group/nature_sounds_society
2. Upgrade our Bulletin - Our Bulletin provides an important benefit for all our members and is the primary benefit for members who cannot participate in our local programs. Over the last year we have expanded the format and content of the Bulletin. The goal is to continue mixing technical, artistic, biological and socially/culturally relevant issues. We hope this will strongly appeal to individuals who work with or have an interest in nature sounds or Natural Quiet.
3. Build our financial foundation - Our financial condition provides the money we use to underwrite the initiatives that make the NSS a major entity in the natural sound/acoustic recording arena. By balancing our general expenses and the profitability of our events and services our bank balance has grown over 25% and we believe we are capable of funding additional important projects in the future.
4. Build our Board - Our recruitment efforts have produced two new members on our Board who clearly bring a vision that can maintain our current position and expand our role in the larger community of natural sound and recording organizations.

We feel that we have made significant progress and that the NSS has the potential to grow and offer more to its members and our world.

Our goals for the next year are focused in two areas:

- 1) Website - Expand the content and usefulness of our website. Key to our success in this area will be finding a website design that can help us build a site that will serve our members more effectively, and establishing a webmaster who can help us maintain it to handle our ongoing needs.
- 2) Natural Quiet - We are working with other organizations to develop a strategy and define initiatives that can enhance awareness of the reduction of natural quiet in our environment. For our first step, we are considering the creation of a 'quiet map' that will show background noise for the San Francisco Bay area. We hope this map will:
 - a) provide a baseline for monitoring changes in noise levels over time;
 - b) send a message regarding the decline in Natural Quiet in this area; and

(continued on page 56 – opposite)

**Synopsis
of
Upcoming Events**

ELEPHANT SEALS AT AÑO NUEVO, SATURDAY, FEBRUARY 9

BASICS OF SOUND RECORDING, SATURDAY, APRIL 20

TECH TALK, SATURDAY, MAY 18

FIELD WORKSHOP, FRIDAY-SUNDAY, JUNE 21-23

BASIC EDITING, SATURDAY, AUGUST 10 (TENTATIVE)

(Please see page 54 for details)