In a wildlife monitoring project, employing Machine Learning (ML) for species identification from video clips can be highly effective. One commonly used approach is using Convolutional Neural Networks (CNNs), a type of deep learning algorithm.

Data Collection & Pre-Processing:

I will gather a diverse dataset of video clips from the camera spots, containing various species of animals and birds.

I will divide the videos into different frames and analyze them over a particular time interval.

To increase the data size the time interval can be reduced accordingly. Each clip should be labeled with the species present.

For each frame, perform preprocessing steps like resizing, normalization, and augmentation (to increase the diversity of the dataset and improve model generalization).

Then we can flatten the image and store it in a list.

I will use the classification algorithm to classify the data based on its nearest neighbors.

from sklearn.neighbors import KNeighborsClassifier

model = KNeighborsClassifier(n\_neighbors=9)

I will adjust the number of neighbours accordingly to get maximum accuracy.

(It is important to note that the number of neighbors should be odd )

Training:

I will split the dataset into training and testing sets using train\_test\_split() function from sklearn.model\_selection. Usually, the training size is much more than the testing data. Use the training set to train the model.

Adjust hyperparameters like learning rate and batch size accordingly and the number of epochs to avoid overfitting.

Testing:

After training, test the model on the testing set to evaluate its performance. Metrics like accuracy, precision, and R2 score can provide insights into the model's effectiveness.

Fine-Tuning:

If the initial model's performance isn't satisfactory, you can fine-tune hyperparameters, adjust the architecture, or try different pre-trained networks.

Deployment: Once satisfied with the model's performance, deploy it to process real-time video clips from the camera spots. The model will process each frame, classify the species, and provide a list of identified species over time.

The success of the approach also relies on continuous monitoring and updates. New species or variations might emerge, and the model would need to be trained with new data accordingly.