In [79]:
```
import numpy as np
```

In [80]:
```
ones_arr = np.ones((5,5))
ones_arr
```

Out[80]:
```
array([[1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.]])
```

In [81]:
```
ones_arr = np.ones((5,5),dtype = int)
ones_arr
```

Out[81]:
```
array([[1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

In [82]:
```
ones_arr
```

Out[82]:
```
array([[1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

In [83]:
```
zeros_arr=np.zeros((3,3),dtype=int)
zeros_arr
```

Out[83]:
```
array([[0, 0, 0],
       [0, 0, 0],
       [0, 0, 0]])
```

In [84]:
```
ones_arr
```

Out[84]:
```
array([[1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

In [85]:
```
ones_arr * 255
```

Out[85]:
```
array([[255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255],
       [255, 255, 255, 255, 255]])
```

In [86]:
```
zeros_arr
```

Out[86]:
```
array([[0, 0, 0],
       [0, 0, 0],
       [0, 0, 0]])
```

In [87]:
```
ones_arr
```

Out[87]:
```
array([[1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1]])
```

In [88]:
```
import matplotlib.pyplot as plt
```

In [89]:
```
%matplotlib inline
```

In [90]:
```
from PIL import Image    # python imaging library
```

In [91]:
```
elephant_img = Image.open(r'C:\Users\sande\OneDrive\Desktop\elephant.jpg')
elephant_img
```

Out[91]:

In [92]:
```
type(elephant_img)
```

Out[92]:
```
PIL.JpegImagePlugin.JpegImageFile
```

In [93]:
```
elephant_arr = np.asarray(elephant_img)
elephant_arr
```

Out[93]:
```
array([[[137, 140, 149],
        [137, 140, 149],
        [138, 141, 150],
        ...,
        [109, 115, 127],
        [110, 114, 126],
        [ 97, 101, 113]],

       [[132, 136, 145],
        [132, 136, 145],
        [132, 136, 145],
        ...,
        [107, 113, 125],
        [109, 113, 125],
        [ 96, 100, 112]],

       [[127, 131, 140],
        [127, 131, 140],
        [127, 131, 140],
        ...,
        [105, 111, 125],
        [105, 111, 125],
        [ 96,  99, 114]],

       ...,

       [[ 55,  73,  23],
        [ 41,  59,  11],
        [ 64,  82,  34],
        ...,
        [ 84, 112,  38],
        [ 75, 103,  29],
        [ 63,  89,  18]],

       [[ 57,  77,  16],
        [ 43,  63,   2],
        [ 56,  76,  17],
        ...,
        [100, 126,  52],
        [ 93, 119,  46],
        [ 72,  98,  27]],

       [[ 65,  84,  18],
        [ 65,  84,  18],
        [ 76,  95,  31],
        ...,
        [ 79, 106,  29],
        [ 85, 111,  37],
        [ 66,  92,  19]]], dtype=uint8)
```

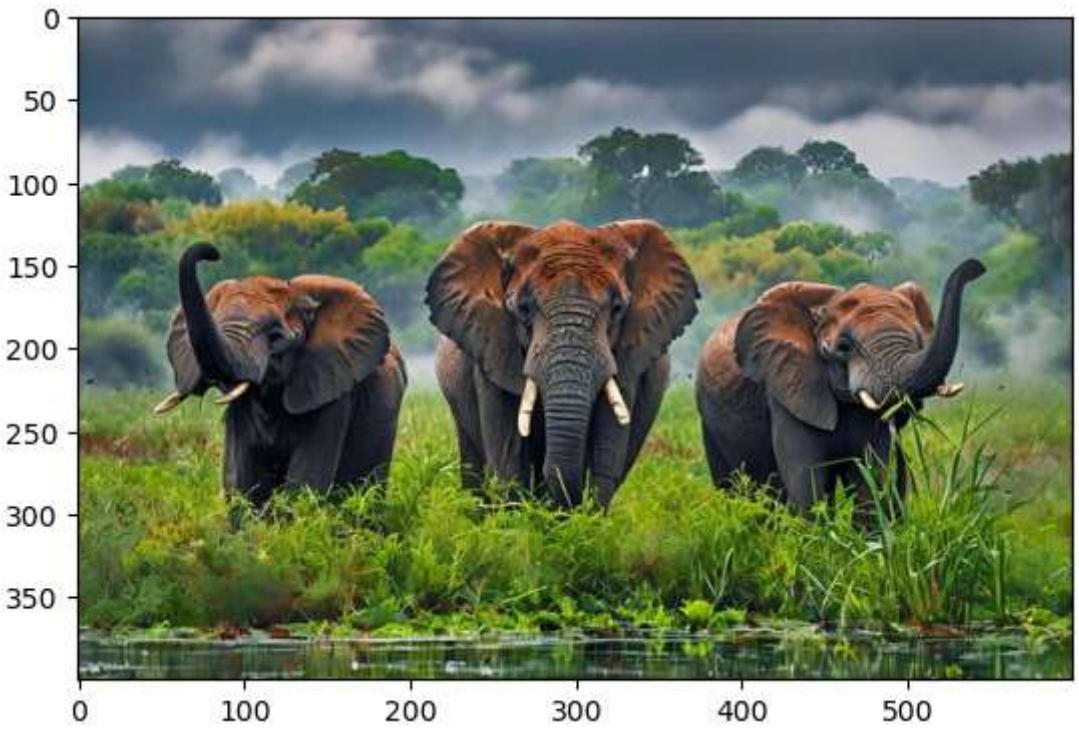
In [94]:
```
type(elephant_arr)
```

Out[94]:
```
numpy.ndarray
```

In [95]:
```
elephant_arr.shape
```

Out[95]: (400, 600, 3)

In [96]:
```
plt.imshow(elephant_arr)
plt.show()
```



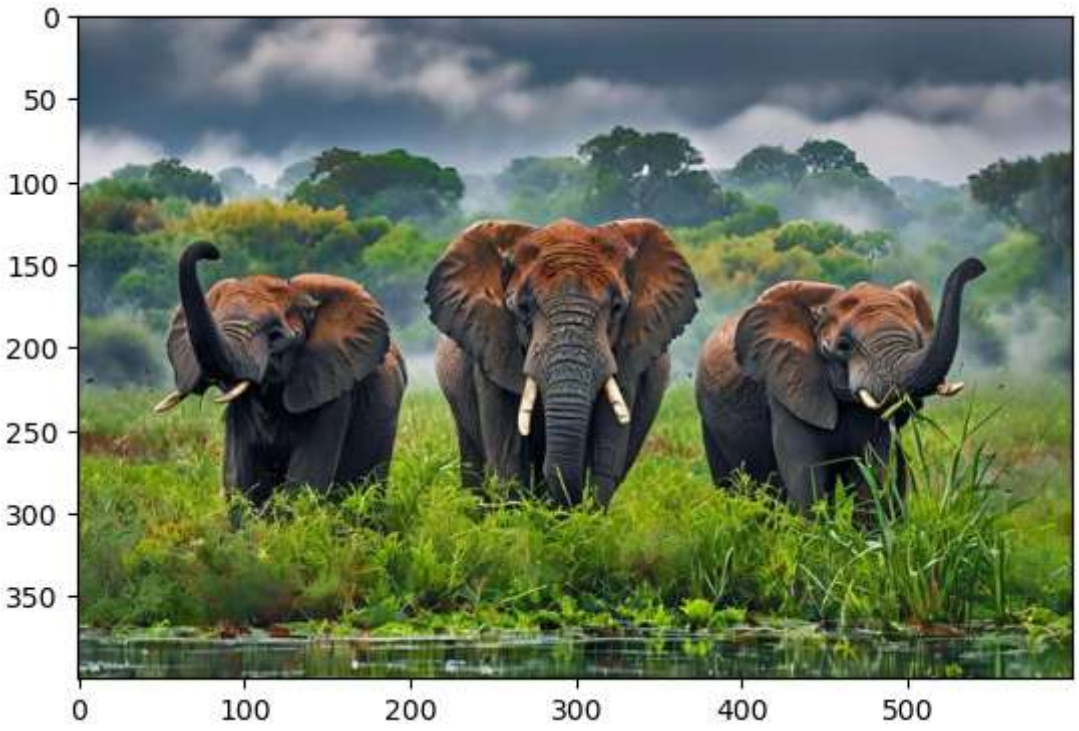
In [97]:
```
elephant_red = elephant_arr.copy()
elephant_red
```

Out[97]:
```
array([[[137, 140, 149],
        [137, 140, 149],
        [138, 141, 150],
        ...,
        [109, 115, 127],
        [110, 114, 126],
        [ 97, 101, 113]],

       [[132, 136, 145],
        [132, 136, 145],
        [132, 136, 145],
        ...,
        [107, 113, 125],
        [109, 113, 125],
        [ 96, 100, 112]],

       [[127, 131, 140],
        [127, 131, 140],
        [127, 131, 140],
        ...,
        [105, 111, 125],
        [105, 111, 125],
        [ 96,  99, 114]],

       ...,

       [[ 55,  73,  23],
        [ 41,  59,  11],
        [ 64,  82,  34],
        ...,
        [ 84, 112,  38],
        [ 75, 103,  29],
        [ 63,  89,  18]],

       [[ 57,  77,  16],
        [ 43,  63,   2],
        [ 56,  76,  17],
        ...,
        [100, 126,  52],
        [ 93, 119,  46],
        [ 72,  98,  27]],

       [[ 65,  84,  18],
        [ 65,  84,  18],
        [ 76,  95,  31],
        ...,
        [ 79, 106,  29],
        [ 85, 111,  37],
        [ 66,  92,  19]]], dtype=uint8)
```

In [98]:
```
elephant_red ==
elephant_arr
```

```
  Cell In[98], line 1
    elephant_red ==
                   ^
SyntaxError: invalid syntax
```

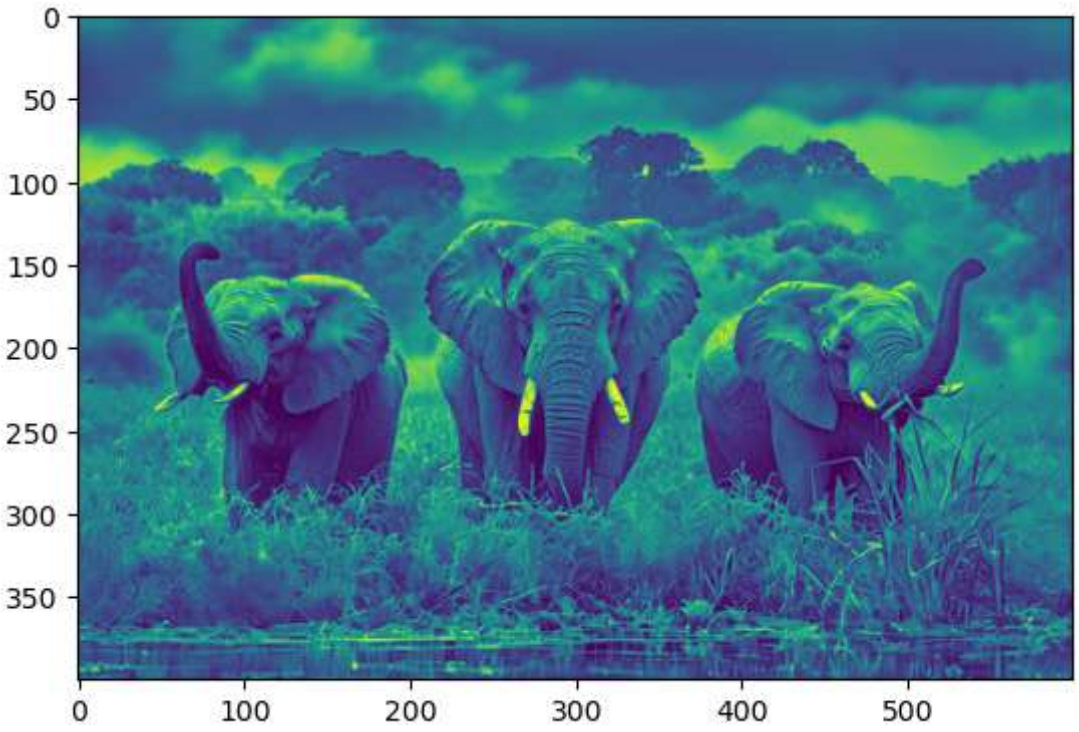
In [99]:
```
plt.imshow(elephant_red)
plt.show()
```



In [100…
```
elephant_red.shape
```

Out[100…
```
(400, 600, 3)
```

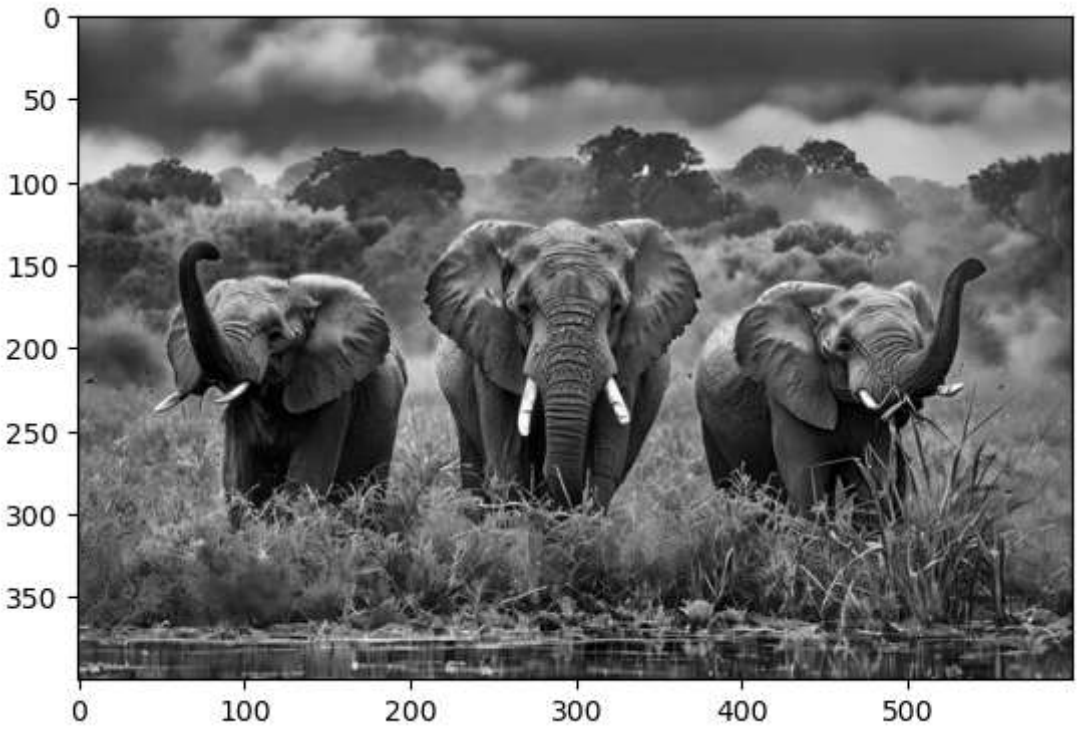
In [101…
```
plt.imshow(elephant_red[:,:,0] )   #R G B
plt.show()
```



In [102…
```
elephant_red[:,:,0]
```

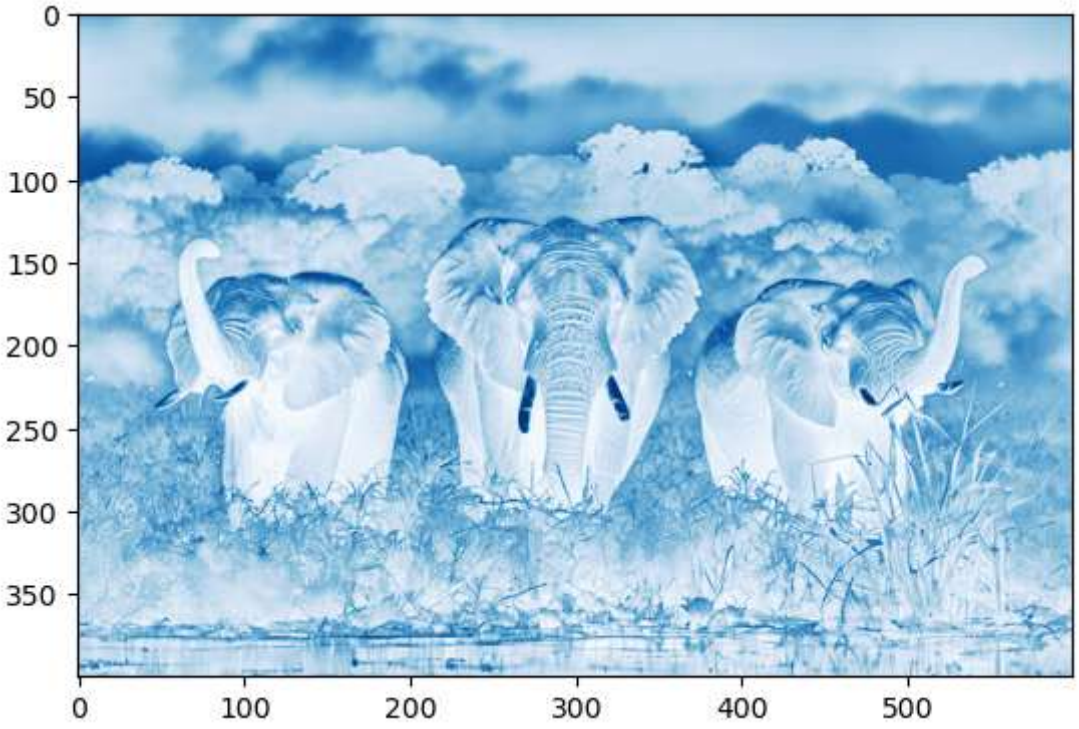
Out[102…
```
array([[137, 137, 138, ..., 109, 110,  97],
       [132, 132, 132, ..., 107, 109,  96],
       [127, 127, 127, ..., 105, 105,  96],
       ...,
       [ 55,  41,  64, ...,  84,  75,  63],
       [ 57,  43,  56, ..., 100,  93,  72],
       [ 65,  65,  76, ...,  79,  85,  66]], dtype=uint8)
```

In [103…
```
plt.imshow(elephant_red[:,:,0], cmap='gray' )
plt.show()
```



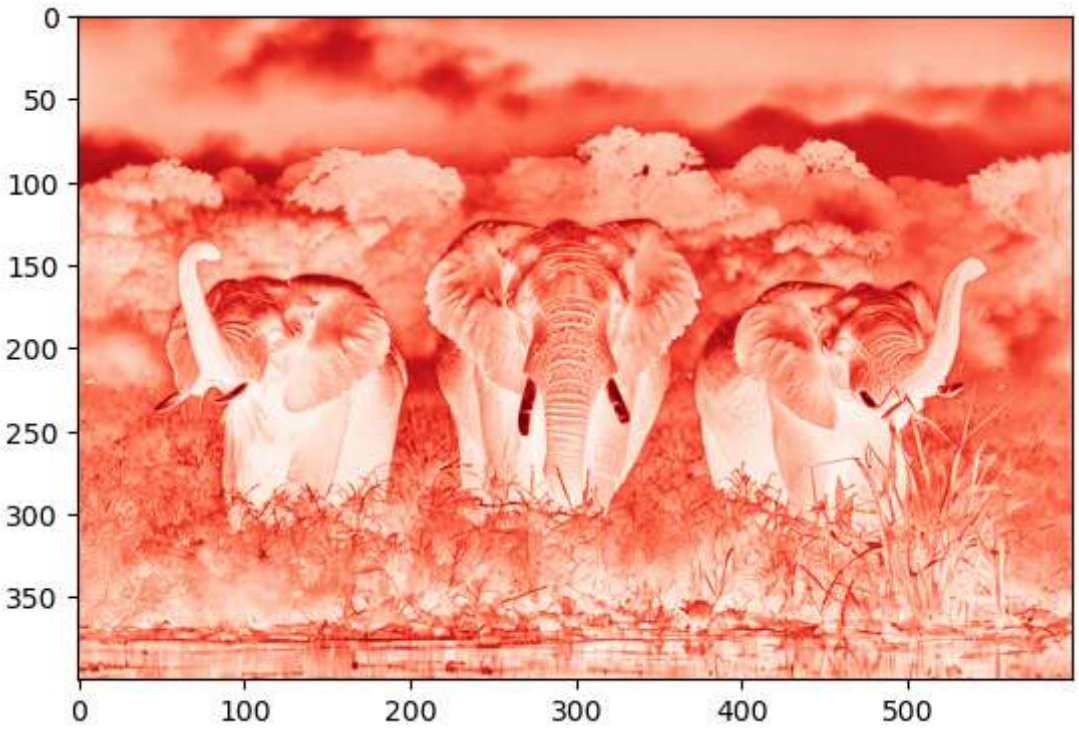
In [104…

```
plt.imshow(elephant_red[:,:,0],cmap='Blues' )
plt.show()
```



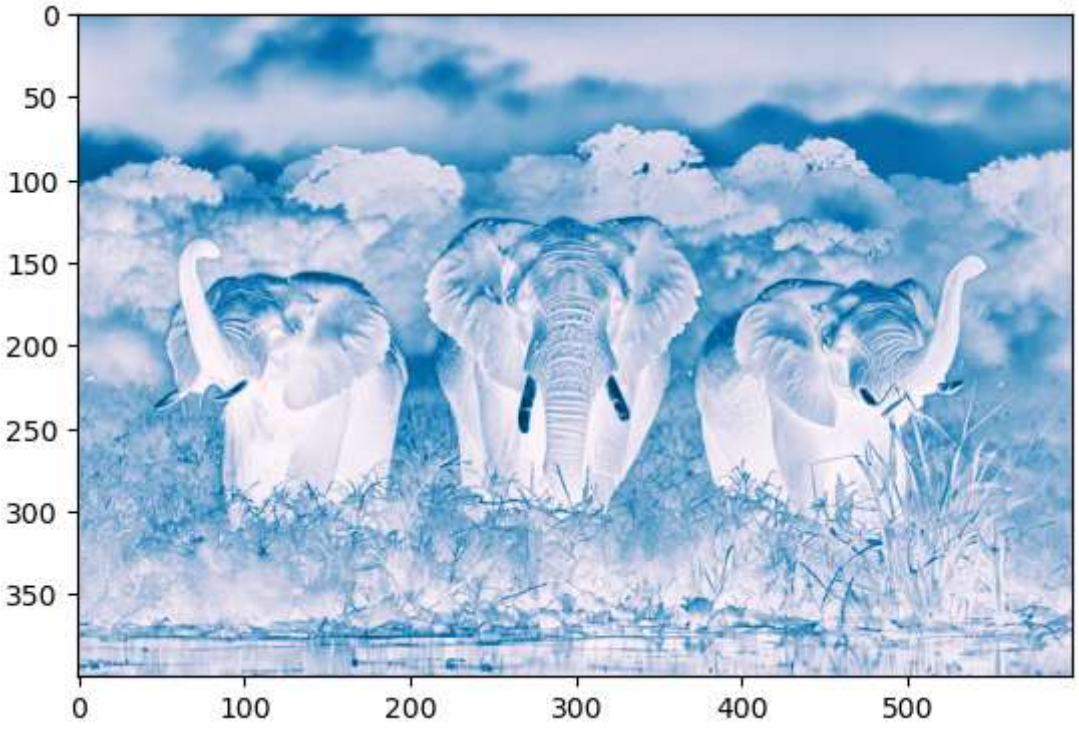
In [105…

```
plt.imshow(elephant_red[:,:,0],cmap='Reds' )
plt.show()
```



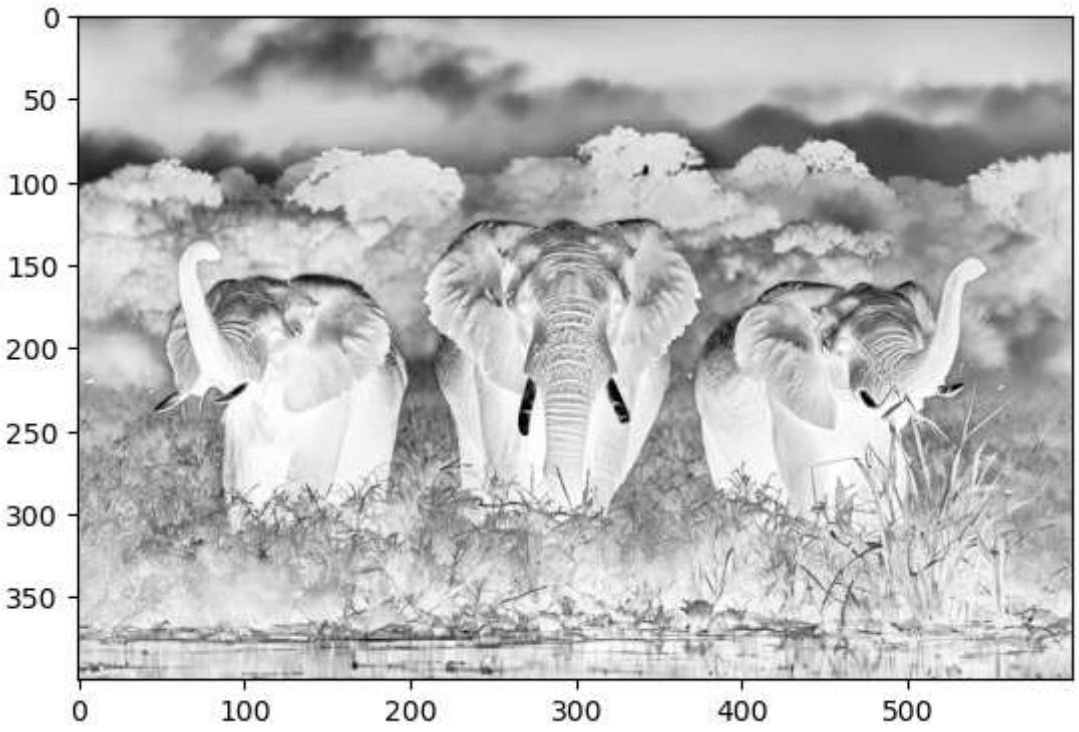
In [106…

```
plt.imshow(elephant_red[:,:,0],cmap='PuBu' )
plt.show()
```



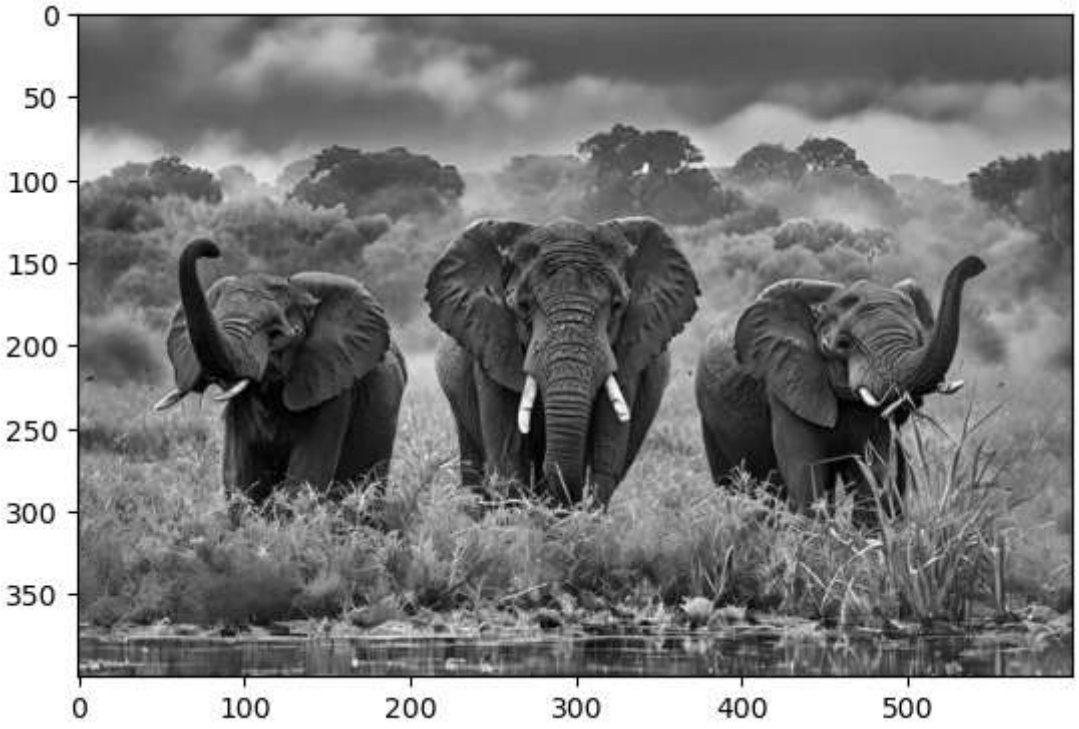
In [107…

```
plt.imshow(elephant_red[:,:,0],cmap='Greys' )
plt.show()
```



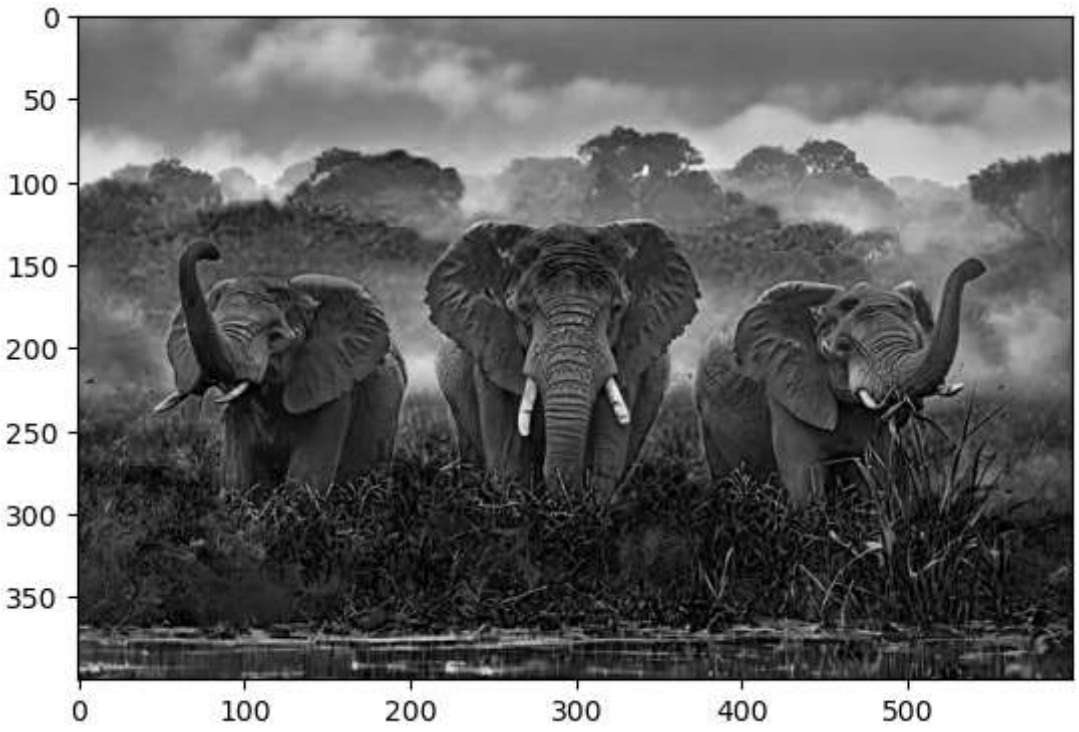
In [108…

```
plt.imshow(elephant_red[:,:,1],cmap='grey' )
plt.show()
```



In [109…

```
plt.imshow(elephant_red[:,:,2],cmap='grey' )
plt.show()
```



In [110…
```
elephant_red[:,:,0]
```

Out[110…
```
array([[137, 137, 138, ..., 109, 110,  97],
       [132, 132, 132, ..., 107, 109,  96],
       [127, 127, 127, ..., 105, 105,  96],
       ...,
       [ 55,  41,  64, ...,  84,  75,  63],
       [ 57,  43,  56, ..., 100,  93,  72],
       [ 65,  65,  76, ...,  79,  85,  66]], dtype=uint8)
```

In [111…
```
elephant_red[:,:,1]
```

Out[111…
```
array([[140, 140, 141, ..., 115, 114, 101],
       [136, 136, 136, ..., 113, 113, 100],
       [131, 131, 131, ..., 111, 111,  99],
       ...,
       [ 73,  59,  82, ..., 112, 103,  89],
       [ 77,  63,  76, ..., 126, 119,  98],
       [ 84,  84,  95, ..., 106, 111,  92]], dtype=uint8)
```

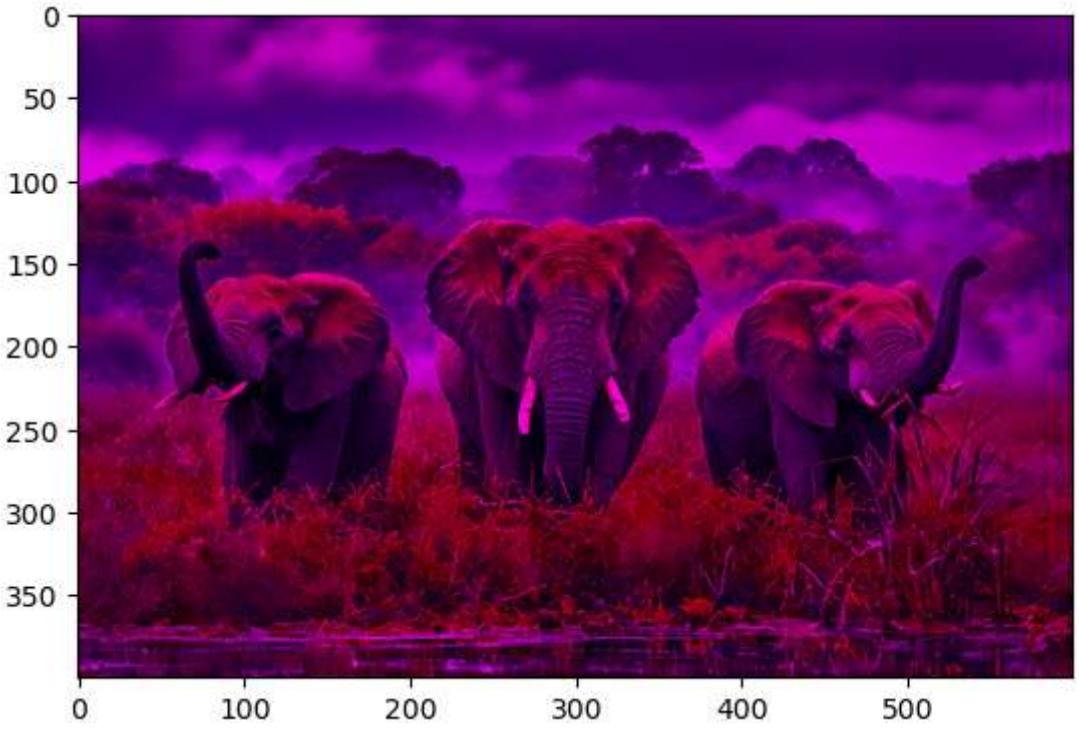
In [112…
```
elephant_red[:,:,2]
```

Out[112…
```
array([[149, 149, 150, ..., 127, 126, 113],
       [145, 145, 145, ..., 125, 125, 112],
       [140, 140, 140, ..., 125, 125, 114],
       ...,
       [ 23,  11,  34, ...,  38,  29,  18],
       [ 16,   2,  17, ...,  52,  46,  27],
       [ 18,  18,  31, ...,  29,  37,  19]], dtype=uint8)
```

In [113…
```
elephant_red[:,:,1] =0
elephant_red[:,:,1]
```

Out[113…
```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

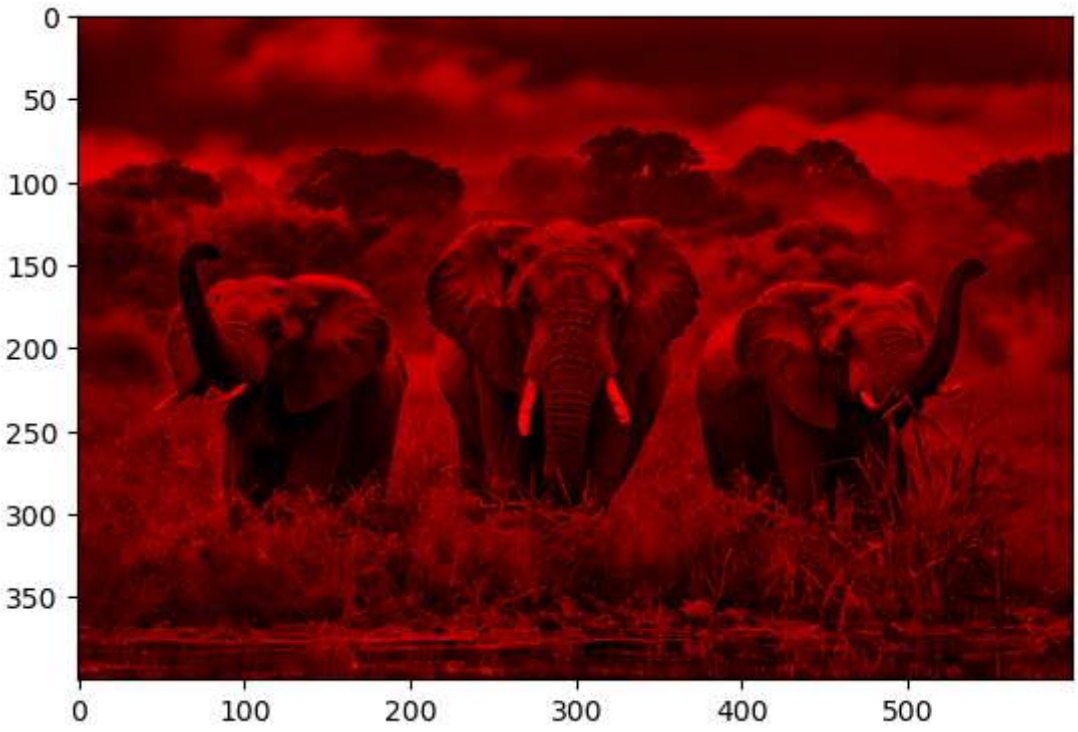
In [114…
```
plt.imshow(elephant_red)
plt.show()
```



In [115…
```
elephant_red[:,:,2] = 0
elephant_red[:,:,2]
```

Out[115…
```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [116…
```
plt.imshow(elephant_red)
plt.show()
```



In [118…

```
arr1 =  np.asarray(elephant_img)
arr1
```

Out[118…

```
array([[[137, 140, 149],
        [137, 140, 149],
        [138, 141, 150],
        ...,
        [109, 115, 127],
        [110, 114, 126],
        [ 97, 101, 113]],

       [[132, 136, 145],
        [132, 136, 145],
        [132, 136, 145],
        ...,
        [107, 113, 125],
        [109, 113, 125],
        [ 96, 100, 112]],

       [[127, 131, 140],
        [127, 131, 140],
        [127, 131, 140],
        ...,
        [105, 111, 125],
        [105, 111, 125],
        [ 96,  99, 114]],

       ...,

       [[ 55,  73,  23],
        [ 41,  59,  11],
        [ 64,  82,  34],
        ...,
        [ 84, 112,  38],
        [ 75, 103,  29],
        [ 63,  89,  18]],

       [[ 57,  77,  16],
        [ 43,  63,   2],
        [ 56,  76,  17],
        ...,
        [100, 126,  52],
        [ 93, 119,  46],
        [ 72,  98,  27]],

       [[ 65,  84,  18],
        [ 65,  84,  18],
        [ 76,  95,  31],
        ...,
        [ 79, 106,  29],
        [ 85, 111,  37],
        [ 66,  92,  19]]], dtype=uint8)
```

In [119…

```
type(arr1)
```

Out[119…

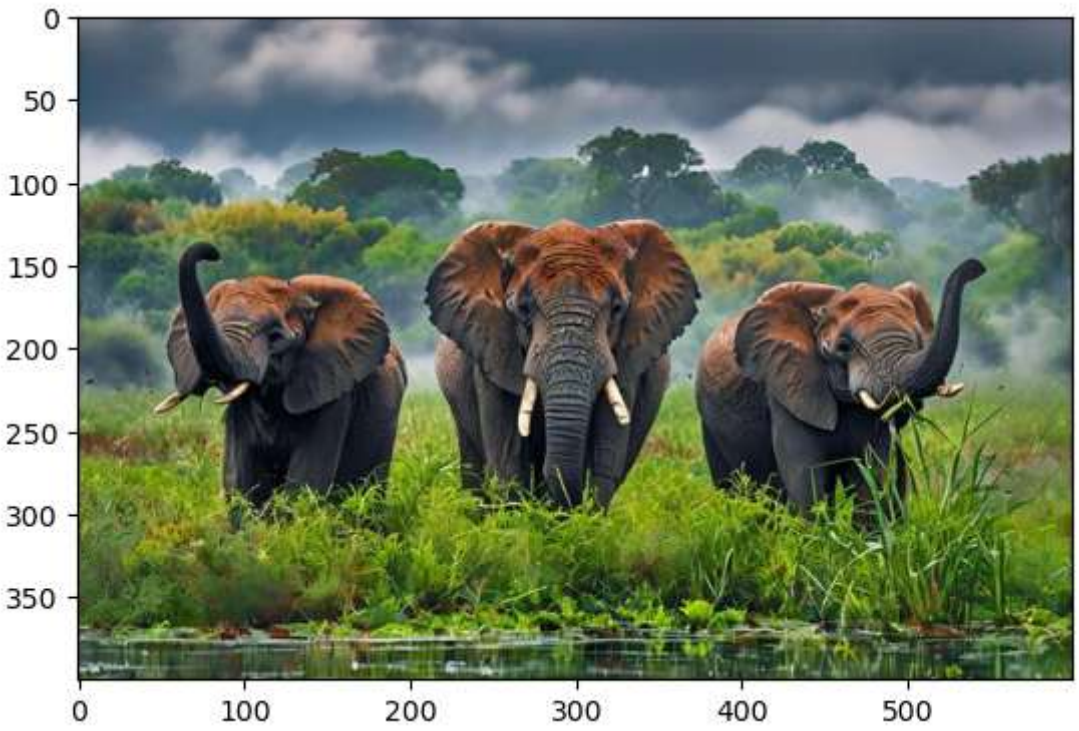
```
numpy.ndarray
```

In [121…

```
arr1.shape
```

Out[121… (400, 600, 3)

In [124…
```
plt.imshow(arr1)
plt.show()
```



In [133…
```
elephant_img1 = arr1.copy()
```

In [134…
```
elephant_img1[:,:,0] = 0
plt.imshow(elephant_img1)
plt.show()
```

In [135…
```
elephant_img1[:,:,1]
```

Out[135…
```
array([[140, 140, 141, ..., 115, 114, 101],
       [136, 136, 136, ..., 113, 113, 100],
       [131, 131, 131, ..., 111, 111,  99],
       ...,
       [ 73,  59,  82, ..., 112, 103,  89],
       [ 77,  63,  76, ..., 126, 119,  98],
       [ 84,  84,  95, ..., 106, 111,  92]], dtype=uint8)
```

In [137…
```
elephant_img1[:,:,1] = 0
elephant_img1
```

Out[137…

```
array([[[  0,   0, 149],
        [  0,   0, 149],
        [  0,   0, 150],
        ...,
        [  0,   0, 127],
        [  0,   0, 126],
        [  0,   0, 113]],

       [[  0,   0, 145],
        [  0,   0, 145],
        [  0,   0, 145],
        ...,
        [  0,   0, 125],
        [  0,   0, 125],
        [  0,   0, 112]],

       [[  0,   0, 140],
        [  0,   0, 140],
        [  0,   0, 140],
        ...,
        [  0,   0, 125],
        [  0,   0, 125],
        [  0,   0, 114]],

       ...,

       [[  0,   0,  23],
        [  0,   0,  11],
        [  0,   0,  34],
        ...,
        [  0,   0,  38],
        [  0,   0,  29],
        [  0,   0,  18]],

       [[  0,   0,  16],
        [  0,   0,   2],
        [  0,   0,  17],
        ...,
        [  0,   0,  52],
        [  0,   0,  46],
        [  0,   0,  27]],

       [[  0,   0,  18],
        [  0,   0,  18],
        [  0,   0,  31],
        ...,
        [  0,   0,  29],
        [  0,   0,  37],
        [  0,   0,  19]]], dtype=uint8)
```

In [138…

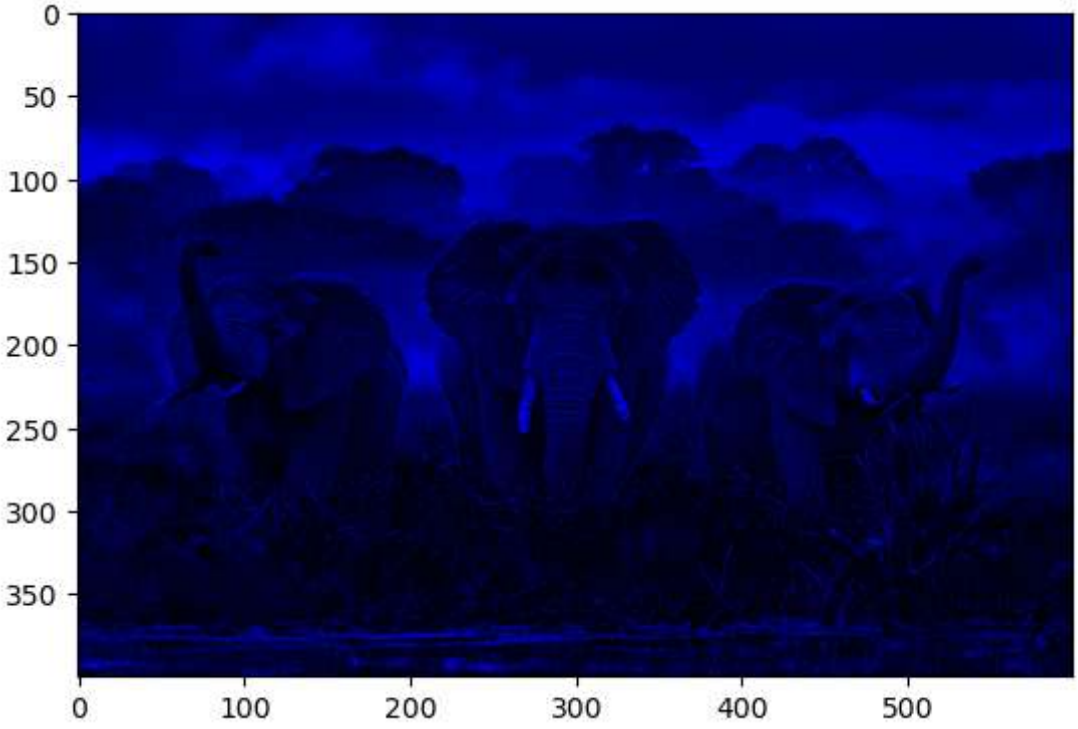
```
elephant_img1[:,:,1] = 1
elephant_img1
```

Out[138…

```
array([[[  0,   1, 149],
        [  0,   1, 149],
        [  0,   1, 150],
        ...,
        [  0,   1, 127],
        [  0,   1, 126],
        [  0,   1, 113]],

       [[  0,   1, 145],
        [  0,   1, 145],
        [  0,   1, 145],
        ...,
        [  0,   1, 125],
        [  0,   1, 125],
        [  0,   1, 112]],

       [[  0,   1, 140],
        [  0,   1, 140],
        [  0,   1, 140],
        ...,
        [  0,   1, 125],
        [  0,   1, 125],
        [  0,   1, 114]],

       ...,

       [[  0,   1,  23],
        [  0,   1,  11],
        [  0,   1,  34],
        ...,
        [  0,   1,  38],
        [  0,   1,  29],
        [  0,   1,  18]],

       [[  0,   1,  16],
        [  0,   1,   2],
        [  0,   1,  17],
        ...,
        [  0,   1,  52],
        [  0,   1,  46],
        [  0,   1,  27]],

       [[  0,   1,  18],
        [  0,   1,  18],
        [  0,   1,  31],
        ...,
        [  0,   1,  29],
        [  0,   1,  37],
        [  0,   1,  19]]], dtype=uint8)
```

In [140…

```
plt.imshow(elephant_img1)
plt.show()
```


0
50
100
150
200
250
300
350
0
100
200
300
400
500